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OF
MRS. PIOZZI (THRALE).

Edited, with Notes, and some Account of her Life and Writings,
by A. HAYWARD, Esq., Q.C.

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MORNING POST.

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REMARKS
ON THE
DIET OF CHILDREN ;

AND ON THE
DISTINCTIONS BETWEEN THE DIGESTIVE POWERS
OF
The Infant and the Adult.

BY
GEORGE T. GREAM,

ONE OF THE PRINCIPAL MEDICAL OFFICERS OF THE QUEEN CHARLOTTE'S LYING-IN
HOSPITAL; LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN
AND CHILDREN; FELLOW OF THE ROYAL MEDICAL AND CHIRURGICAL
SOCIETY, ETC. ETC.

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TO
THOMAS ARTHUR STONE, Esq.

WHOSE UNVARYING FRIENDSHIP HAS GREATLY CONTRIBUTED
TO THE EARLY SUCCESS IN PRACTICE

OF HIS OBLIGED AND
FAITHFUL RELATIVE,

THE AUTHOR.

March 3, 1847



P R E F A C E.

IN these remarks I have only attempted to consider superficially the subjects stated in the title-page. I have ventured upon no new ground,—I have put forward no new theories; but I have simply insisted upon that, which is proved to us repeatedly in the Scriptures, and which, although spiritually mentioned, is nevertheless alluded to in a more temporal sense,—the goodness of that food which God has designed for infants. “I have fed you with milk, and not with meat: for hitherto ye were not able to bear it.”—1 CORINTH. iii. 2.

42, HERTFORD STREET, MAY FAIR,

March 3, 1847.



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ON THE
DIET OF CHILDREN.

CHAPTER I.

INTRODUCTORY REMARKS.

THE following considerations upon the important subject of children's food, are intended to apply principally to the two first years of infancy; for it is in that early period that the great difficulty of carrying into effect a proper dietetic arrangement most commonly occurs: first, in adapting the strength and quality of breast-milk to the digestive powers of the stomach, and then, in determining what kind of food should be substituted for it, when circumstances indicate the necessity of a change.

So numerous are the works upon diet and digestion in general, that it would be superfluous to attempt any additions upon this subject, had the

different cases of children and adults been treated with equal judgment and ability,

There are many diseases which belong exclusively to infancy; others there are which, although they bear an exact resemblance to diseases of mature age, require in infants treatment of a totally different character.

Hence infantile diseases form a distinct branch of medical study. This fact, however, does not render it excusable in any practitioner to be ignorant of them; and although it is to be regretted that the opportunities of investigation are few in this country, owing to the scarcity of infirmaries where children in large numbers are brought together, yet the difficulty in becoming acquainted with diseases of this class is not so great as absolutely to prevent the student from acquiring a fair knowledge of them, previously to the commencement of his professional career.

From the time of Hippocrates down to the middle of the last century, scarcely any practical information with regard even to the general management of children had been published. Those who practised midwifery undertook also the treatment of infantile diseases, but they were generally either women or illiterate persons: nor would there have been any improvement in this respect, had not the acknowledged scientific cha-

racter of this part of medicine, forced at length the authorities of the Medical Colleges, with one exception, to treat it with due consideration; so that, greatly to the credit of the present age, the same honours are now open to those who practise midwifery as to those who do not combine it with their other practice.

The first books of any note upon children, were two by Dr. Heberden, and one by Sir George Baker; subsequently, Drs. Osborn and Denman wrote upon the subject, and they were followed by Dr. Underwood; before this, the only books from which the student could gain information, were a small volume by Dr. Harris, and an imperfect publication by Dr. Armstrong.

A detached treatise was published by Dr. Butter upon infantile fever, a disease previously undistinguished from the ordinary fever of adult age.

Dr. Hamilton and Dr. Monro afterwards wrote upon diseases of children; and now the treatises that are before the public are too numerous to particularise, but the names of many of the authors will be a sufficient guarantee for the ability of their works, and prove at the same time that the subject is in all senses a scientific one.

The great source of half the diseases of the human frame is to be found in the alimentary

canal; this is admitted to be true in adults, and must therefore be allowed to a much larger extent in the case of infants, whose diet is not likely to have received such attention as it really demands, amidst the general ignorance respecting the diseases of children which for a long time prevailed. In fact, the great majority of those which occur under two years of age arise from improper food, and there is no doubt that if more correct views were entertained of the powers of infant digestion, the mortality amongst them would be considerably lessened.

It is not, however, in the power of the medical profession individually or collectively to remedy the evil: it exists chiefly in the prejudices of parents. Many who would consider it a great offence in an attendant to administer anything to a child without their sanction, will deliberately insist upon its being fed on substances which necessarily act as poison upon the infant constitution, and which have been actually forbidden by medical authority.

Those who are in the habit of treating children in sickness will agree with me in what I state, and will be aware how completely medical advice, in respect of diet, is set at defiance by the prejudices and idle notions of nurses and of parents.

It is a fact of the utmost importance, to remark

to what a great extent the mortality amongst children under five years of age has decreased since the middle of the last century ; the time, it will be observed, when the diseases of children were first brought specifically under the scientific notice of the medical profession :—

From 1730 to 1750 the deaths were 74 per cent.

„ 1810 to 1830 . . . 31 „

There is no doubt that wealth and education have done much in this respect, but the improvement in medicine may be fairly said to have had a great share in producing the result.

Notwithstanding the great increase of population, the average period of human life is prolonged, and the mortality of adults proportionably lessened ; now both these results may, I think, be reasonably attributed in some degree to the improved treatment of diseases, and to a better system of feeding in infancy.

In the 3rd century the mean duration of life was estimated at thirty years ; now it is 50.

The following estimate will show the improvement as regards the number of deaths :—

In 1786 the deaths in England and Wales were 1 in 42

1801 1 in 47

1831 1 in 58

showing an improvement in half a century of 38 per cent.

Within the same period the deaths of persons under twenty years of age have diminished nearly one half—from 1 in $76\frac{1}{2}$ to 1 in 137.

As in hospitals and in the army an estimate is more easily made than in putting together numerous detached instances, so in schools of large size, a calculation may readily be formed as to diseases in the early periods of life, and the mortality amongst those of tender years.

The deaths in Christ's Hospital from 1829 to 1833 were only one in $157\frac{1}{2}$. Dr. Mitchell, in his factory report, states that this small mortality is owing to "substantial clothing, abundance of wholesome food, healthful exercise in the hours allowed for recreation, and immediate attention to the first appearance of sickness under skilful medical men."

From 1771 to 1777, 31,951 deserted children were received into the foundling hospital of Paris, and of those, 25,476 died before the end of the first year, but in 1823 one-half of those received survived to the end of this period.

The French physicians cannot, indeed, be said to show much ability in the diseases of children, though praise is of course due to them for effecting so great a reduction of mortality; a judicious attention to diet, and the substitution for sugar and

water, of the breast-milk of healthy and intelligent nurses, under whose care the children are sent into the country, being no doubt the great cause of their success.

These mortality tables, however, do not fully point out the improvements that have actually been made; for no account is taken of the numerous diseases not resulting in death, under which children suffer.

It appears according to the bills of mortality, which were at that time the only statistical tables respecting the population, that from 1660 to 1799 the number of deaths in England and Wales amounted to 836,285.

Of these, 281,408 occurred before the age of 2 years, and 113,393 between 2 and 10.

In many years at the end of the last century, more than a third of the burials were of children under two years of age.

The following observations of the late Dr. John Clarke on some of the most important diseases of children, show the important light in which he regarded the question of infant mortality:—
“It must on all hands be admitted that, *cæteris paribus*, the strength of every nation will be proportionate to its population, and that everything that has a tendency to diminish the population

must affect its strength and prosperity. It has been maintained, and perhaps with great truth, that the population of a country will be proportionate to the means of subsisting the inhabitants, but the want of subsistence can hardly be supposed in this country to be a sufficient explanation of the extensive mortality among children under ten, but especially under two years of age."

The note subjoined, also by Dr. Clarke, is interesting at the present moment, as shewing the extensiveness of the author's views, who seems to have suggested, twenty-five years ago, what is now the great object of persons connected with land in this country, and in Ireland.*

Since, then, the affording proper nourishment to the human frame during the early years of childhood, is confessedly of so great importance, it will

* He says: "It is difficult to set bounds to the power of a country to subsist its inhabitants. In Great Britain, and still more in Ireland, there are large districts of waste land unemployed at present, so that they could maintain a greater number than they do." "In Ireland, immense tracts of bog are capable of being reclaimed, if encouragement were given to the inhabitants to exert themselves. Moreover, the commercial intercourse of their dominions with other nations would produce the importation, if necessary, of very large quantities of grain in the way of exchange. If the population should increase much beyond its present extent."

not be supposed that the most exact attention to the diet of infants can be misapplied.

No medical practitioner can be ignorant of the want of readiness to receive and to retain instruction, in boys of slow circulation and of languid disposition. How often are such boys brought before our notice because they do not "get on" at school; and how often is it in our power to accomplish what the cleverest instructors, whether private or public, have failed to achieve; to supply supposed deficiencies in the intellect, and to overcome difficulties of this nature, which in former times were thought to be insurmountable.

How often at public schools are boys punished day after day with the utmost severity because they cannot retain "by heart" a prescribed task, to which they are in fact unequal; an incapacity arising neither from idleness, nor from any permanent inability, but from a depressed state of system, from want of blood to supply the brain with energy, owing commonly either to rapid growth, to habitual languor of circulation, to want of nutritious and digestible food, to a morbid state of the digestion, an insufficiency of recreation and exercise, or to intervals of too long duration between meals, or to debilitating habits which it is to be feared are too often practised by boys.

In nine out of ten such cases, tonics, regulated diet, and such cheerful exercise as occupies and engages the thoughts, while it strengthens the limbs, will produce an effectual cure ; and many, no doubt, among the eminent characters of the present day, owe their success in life to some timely medical interference, or some accidental circumstance of change of air or scene, which supplied to them in early life the necessary cerebral stimulus. On the other hand, it is melancholy to reflect how many there are, who seemed formed by nature for better things, whose weak and stunted intellect in maturer age (from some constitutional defect, or injudicious management, which might have been thus easily corrected) has disappointed these early expectations, and reduced the unfortunate subjects of them below the ordinary level.

On other grounds, and in a national point of view, the medical profession has just claims upon the legislature for more honourable encouragement.

It has yet to be shown that members of the medical profession are less eligible candidates for the higher honours of the state, than those of the law, or the army and navy ; their rewards, however, unlike all other professions and employments, are limited to titles of an inferior class, and even

orders of merit, which were formerly within their reach, are now withheld, since the Hanoverian Order ceased to be in the gift of the Sovereign of this country, upon its separation from Hanover.

CHAPTER II.

DIGESTION.

MR. MAYO commences an article on diet, by quoting Dr. Arnott's description of a steam-engine:—"In its present perfect state, the steam-engine appears a thing almost endowed with intelligence. It regulates with perfect accuracy and uniformity the number of its strokes in a given time, and counts and records them, moreover, to tell how much work it has done, as a clock records the beats of its pendulum; it regulates the quantity of steam admitted to work, the briskness of the fire, the supply of water to the boiler, the supply of coals to the fire; it opens and shuts its valves with absolute precision as to time and manner; it oils its joints; it takes out any air that may accidentally enter any part that should be vacuous; and when anything goes wrong it cannot of itself rectify, it warns its attendant by ringing a bell. Yet, with all these talents, and even when possessing the power of a hundred horses, it is obedient to the hand of a child; it never tires, and wants no sleep; it is

not subject to a malady, when originally well made, and only refuses to work when worn out with age ; it is equally active in all climates, and will do work of any kind ; it is a water-pumper, a miner, a sailor, a cotton-spinner, a weaver, an blacksmith, a miller, &c. ; and a small engine, in the eharacter of a steam pony, may be seen dragging after it, on a railroad, a hundred tons of merchandise or a regiment of soldiers, with greater speed than that of our fleetest coaches. It is the king of machines, and a permanent realisation of the genii of Eastern fables, whose supernatural powers were occasionally at the command of man."

He adds, " that, in order that the steam-engine may perform these wonders, and work in any of the capacities that have been enumerated, two things are necessary—the engine must be fed, and as its parts become worn by use they must be repaired. It must be supplied with coal, wood, charecoal or other combustible matter, and water, which it converts into power ; and when the machinery is injured, what is imperfect must be changed and replaced.

" The machinery of the animal frame works under the same conditions. In order that it may energize, it must have food ; and that it may not sensibly be deteriorated by use, it must undergo

constant repairs. But there is this difference in the two cases: in the animal frame, the source both of its energies and of its structural restoration is one and the same; its food furnishes both. The blood, which is formed from our food, flowing to the brain, and the muscles, and the stomach, not merely maintains their power, but, in addition, carries to the same parts, and to all the rest, the materials of their growth and renovation.

“The supply of food to the steam-engine has one purpose only to effect. It is again administered with absolute precision as to time and quantity, for it is meted out by those who understand the construction and working of the machinery, who know its wants exactly, and have no bias from prejudice or inclination to supply them otherwise than with vigorous exactness.

“The food of human beings, more complicated in its objects, is meted out under much less favourable circumstances. The party who apportions it for the most part does not understand the action or the wants of the machine which he undertakes to supply, and what is more, for a long period is not only incurious upon the subject, but often disposed to repel any information which may fall in his way. His motive for conveying aliment into his inside is of a totally different complexion to a calculated forethought of

the needs of his economy ; his exclusive object is to please two senses, and to gratify two appetites." These observations cannot fail to attract attention to the important subjects on which I propose in the first instance to dwell ; those, namely, of digestion and diet.

Digestion is that process which food undergoes in order that it may be converted into blood.

Upon its being received into the mouth, it is subjected to mastication and insalivation.

The former is necessary in order that the portion of food may be so minutely divided, as to be acted upon immediately and throughout its entire quantity, by the chemical means prepared for that purpose in the stomach.

"The practice of giving solid food," wrote Dr. J. Clarke, "to a toothless child, is not less absurd than to expect corn to be ground when there is no apparatus for grinding it. That which would be considered an evidence of idiotism or insanity in the last instance, is defended and practised in the former.*

* It is often supposed that meat finely divided with a knife is brought into the same state as masticated meat. It is scarcely necessary to refute this mistake, for it is evident that meat when masticated is bruised, and its particles divided in a way that cannot be so well accomplished by any artificial means. Besides, as nature has not provided infants with the means of mastication, so neither are the powers of digestion in the stomach adapted to any other than liquid food.

“It will be seen that children are so fed in their most tender age, and it is not wonderful that present evils are by this means produced, and the foundation laid for future disease.”

The same division of particles is required when any substance whatever is to be subjected to chemical experiment.

When food is received into the stomach undivided, the surfaces of it only are acted upon by the gastric juice, the internal parts remaining so long undigested that they offend the stomach and cause vomiting; or, if carried into the intestines, produce colic and other affections.

An opportunity of performing a series of most interesting experiments* on digestion was afforded to Dr. Beaumont, surgeon in the United States' army, in the person of a young man named Alexis St. Martin, who had received a gun-shot wound which carried away a portion of his stomach. The wound healed, but did not unite, for an opening was left through which it was practicable to introduce food, and the whole process of digestion could easily be perceived.

By these experiments, a great addition to our

* Published in this country by Dr. Combe, and the theories derived from them are valued so highly that they form the subject of examination at the College of Physicians.

knowledge with regard to the physiology of digestion has been made. Many theories have been controverted by them, as well as many confirmed, which, but for such an opportunity of actual examination, falling under the notice of so clever and persevering a physiologist, must, it would seem, have remained in uncertainty.

By means of this opening, Dr. Beaumont was enabled to do what had hitherto appeared impracticable; he obtained gastric juice unmixed with matter of any kind.

“St. Martin,” says Dr. Beaumont, “breakfasted on a day named at 8-30. A. M., upon beef-steak, bread, and coffee; at the same time he thoroughly masticated four drachms of the steak, which I put into the gastric juice just before taken from the stomach. To another similar quantity of gastric juice I put the same quantity of steak, unmasticated, and in one entire piece: I placed them both in a bath at 100°.

“At 11 o'clock I examined the stomach, and found the breakfast nearly digested, and more than half gone from the stomach.

“I took out an ounce of what remained, which was almost completely chymified, a few particles of the bread, in a soft pultaceous condition, only remaining, and compared them with the two parcels in the bath. It very nearly resembled the mas-

tiated meat in the gastric juice, but was more digested and thinner, and contained particles of oil (melted butter) and bread, which were not in the masticated food in the vial. The unmasticated meat differed considerably. It was not so thick and gelatinous-like, but of a darker colour ; and the piece of meat retained its shape, and was not much diminished in size, the surface only a little wasted, softened, and covered with a cineritious coat.

“ The contents of the vials, continued in the bath for twenty-four hours, exhibited the following changes. The portion taken from the stomach at 11 o'clock remained nearly the same as when extracted, perhaps more completely chymified. That which was masticated and put into the gastric juice, was reduced to a thick, pulraceous, semi-fluid mass, but retaining some distinct fibres of the meat, which, after standing awhile, subsided to the bottom of a yellowish whey-coloured fluid.

“ The unmasticated piece of meat had undergone an evident process of digestion. It was about *half diminished*, and the texture of the remaining part loose and soft.”

This experiment, therefore, shows the necessity for the division of food by mastication, in order

that healthy and speedy digestion may be performed.

With regard to insalivation, Dr. Beaumont and others are of opinion that water would answer all the purposes for which saliva is useful, but that a little preference may be given to the latter, owing to a certain "quantity of mucus which it contains, and which makes it of greater effect in the act of deglutition.

Majendie was of opinion that saliva had a chemical effect upon food, as also was Professor Jackson, of Philadelphia; and Dr. Paris* goes so far as to say, that "insalivation is as essential as mastication is to digestion;" and, again, that saliva is "obviously essential to a healthy digestion."

How far Dr. Paris and the other authors would now be inclined to maintain their theory may be doubtful, for certainly nothing can be so clearly established as the fact of saliva being unnecessary to digestion, by the experiments of Dr. Beaumont, most of which were performed without any admixture of that fluid with the food used; and he asserts that chyme formed of food unmixed with saliva exhibited the same sensible appearances, and was affected by re-agents in the

* On Diet.

same way as that which had been formed from food previously masticated, mixed with saliva and swallowed.

Deglutition should be performed slowly at all times.

The stomach is only capable of supplying gastric juice in quantities sufficient to mix with the particles of food it receives gently and equably within its cavities ; hence the distress and annoyance resulting from a too hastily devoured meal, or from an excessive quantity of food being taken into the stomach. In children, there is a provision to remedy the effect of a too full meal ; the constant act of vomiting relieves them, and it is performed with such facility, that no extraordinary muscular action is necessary as in the adult.

It is a true saying, that a child who is frequently sick is a healthy one.

It may be supposed that the sense of taste being enjoyed only while food is in the mouth, and ceasing when it passes into the stomach, is intended as an encouragement to retain it in the mouth, to masticate it freely, and to allow sufficient time for each deposit of masticated food to receive its due share of gastric fluid, before another follows it into the stomach.

When food, either solid or in finely divided

quantities, was placed through the opening into St. Martin's stomach, a "gentle contraction or grasping motion" took place, and continued for fifty or eighty seconds, and would not allow of the introduction of another quantity until the above time had elapsed, when more food would be received.

The next process which the food undergoes in the stomach is chymification.

Two actions are exercised in the stomach to effect chymification; the one is the mechanical motion of the muscular fibres of the stomach, and the other is the chemical effect of the gastric juice upon the food.

Chymification consists in the change from a heterogeneous mass to an homogeneous semi-fluid. It is to be considered as the first stage of the conversion of food into blood.

The stomach is supplied with muscular fibres, some circular and some longitudinal, which by alternately acting and relaxing, produce a vermicular or peristaltic motion.

When these fibres all act together, they lessen the cavity of the stomach, and press upon the food contained in it. These motions not only produce a perfect mixture of the particles of food, but they cause it to revolve around the interior,

from point to point, and from one extremity to the other.

Dr. Beaumont, when introducing the stem of a thermometer, for the purpose of ascertaining the temperature of the stomach, through the artificial opening in St. Martin, found that it was moved in a spiral direction, both in descending to the pyloric and ascending to the splenic extremity. These motions are completed in from one to three minutes.

While these motions are being performed, trituration and agitation are going on; there is a perfect mixture of the whole food.

Various opinions have been entertained with regard to the manner in which chyme escapes from the stomach, the general supposition being, that it passes through the pylorus at intervals, owing to the sudden relaxation of its muscular fibres.

Dr. Beaumont supposes "that from the moment chymification commences until the stomach becomes empty, portions of chyme are passing into the duodenum through the pyloric orifice, as the mass is presented at each successive revolution;" he says he infers this from the fact that "the mass is constantly decreasing." This decrease is slow at first, but rapid towards the conclusion of digestion.

“In attempting to pass a long glass thermometer tube through the aperture, into the pyloric portion of the stomach during the latter stages of digestion, a forcible contraction is first perceived at this point, and the bulb is stopped. In a short time there is a gentle relaxation, when the bulb passes without difficulty, and appears to be drawn quite forcibly for three or four inches to the pyloric end. It is then released and forced back, or suffered to rise again, at the same time giving to the tube a circular or rather spiral motion, and frequently revolving it completely over.” The band of fibres more actively than others engaged in this latter action, is situated three or four inches from the pyloric end of the stomach.

Several experiments which were tried upon St. Martin all prove the absolute necessity of the powerful agitation of food, in order that it may be speedily and healthily digested. This is more especially shown in the following experiment:—Dr. Beaumont says: “At 11 A.M. I took a solid piece of boiled recently salted beef, weighing three drachms, and put it into the liquor (an ounce of gastric juice) in the vial; corked the vial tight, and placed it in a saucepan filled with water, raised to the temperature of 100° , and kept at that point in a nicely regulated sand-bath. In

forty minutes digestion had distinctly commenced over the surface of the meat. In fifty minutes the fluid had become quite opaque and cloudy ; the external texture began to separate and become loose. In sixty minutes chyme began to form. At 1 o'clock, P.M. (digestion having progressed with the same regularity as in the last half hour), the cellular texture seemed to be entirely destroyed, leaving the muscular fibres loose and unconnected, floating about in fine small shreds, very tender and soft.

“ At 3 o'clock the muscular fibres had diminished one-half since last examination at 1 o'clock ; at 5 o'clock they were nearly all digested, a few fibres only remaining. At 7 o'clock the muscular texture was completely broken down, and only a few of the small fibres floating in the fluid. At 9 o'clock every part of the meat was completely digested. At 11 A.M. I suspended a piece of beef, similar exactly to that in the vial, into the stomach through the aperture ; at 12 o'clock withdrew it, and found it as much affected by digestion as that in the vial ; there was little or no difference in their appearance : returned it again. At 1 o'clock P.M. I drew out the string, but the meat was all completely digested and gone.”

The effect of the gastric juice on the piece of meat suspended in the stomach, was similar to

that in the vial, only more rapid after the first half hour, and sooner completed. Digestion commenced upon the surface, and was confined to it on both occasions. Agitation accelerated the solution in the vial, by removing the coat that was digested on the surface, exposing the remainder of the meat to the action of the gastric fluid, and giving that fluid access to the undigested portion.

The time occupied in the digestion of the meat in the vial was from 11 A.M. till 9 P.M. without agitation.

That in the stomach, under the influence of its muscular action, was from 11 A.M. to 1 P.M.

The necessity for this powerful action of the stomach upon food, in order to its perfect digestion, should be much considered in the dietetic arrangements of children.

The other process by which food is affected in the stomach is purely chemical.

It is the consequence of the action of the fluid proper to the stomach upon it. This fluid is poured out from minute papillæ upon the mucous surface of the stomach, but is entirely absent from its cavity, unless food or any other substance producing irritation excites it.

Spallanzani was the first person who discovered that gastric juice would dissolve animal matter;

and Mr. Hunter discovered that it would even digest, after death, the very stomach by which it was secreted.

Its solvent power has been proved by Dr. Beaumont in many most valuable experiments. In the subject before mentioned, it was possible to extract great quantities of gastric juice from the stomach through the external opening; and both in and out of the cavity its effect in dissolving food has been most elaborately tested.

He found, however, that its solvent power had but little effect unless accompanied by heat, and that 100° of temperature were requisite to accomplish chymification. He found also, as is mentioned above, that although it would eventually produce the same effect upon aliment, yet, without agitation, a speedy solution of food was not to be obtained.

Dr. Beaumont describes the mode of its secretion, as observed by him in St. Martin's stomach: he says, "immediately beneath the mucous coat, and apparently incorporated with the villous membrane, appear small spheroidal or oval-shaped glandular bodies, from which the mucous fluid appears to be secreted.

"By applying aliments or other irritants to the internal coat of the stomach, and observing the effect through a magnifying glass, innumerable

minute lucid points and very fine mucous or vascular papillæ can be seen arising from the villous membrane, and protruding through the mucous coat, from which distils a pure, limpid, colourless, and slightly viscid fluid. The fluid thus excited is invariably distinctly acid.

“The mucus of the stomach is less fluid, more viscid or albuminous, semi-opaque, sometimes a little saltish, and does not possess the slightest character of acidity. On applying the tongue to the mucous coat of the stomach in its empty, un-irritated state, no acid taste can be perceived; when food, or other irritants, have been applied to the villous membrane, and the gastric papillæ excited, the acid taste is immediately perceptible.

“These papillæ I am convinced, from observation, form a part of what are called by authors the villi of the stomach. Other vessels, absorbing as well as secretory, compose the remainder. That some portion of the villi forms the excretory duct of the vessels or glands I have not the least doubt, from innumerable ocular examinations of the process of secretion of gastric juice.”

Dr. Beaumont's mode of extracting gastric juice he describes thus:—“The usual method of extracting gastric juice for experiments is, by placing the subject on his right side, depressing

the valve* within the aperture, introducing a gum elastic tube, of the size of a large quill, five or six inches into the stomach, and then turning him on the left side, until the orifice becomes dependent.

“ In health, and when free from food, the stomach is usually entirely empty, and contracted upon itself. On introducing the tube, the fluid soon begins to flow, first in drops, then in interrupted, and sometimes in a short continuous stream.

“ Moving the tube about, up and down, or backwards and forwards, increases the discharge. The quantity of fluid ordinarily obtained is from four draehms to one and a half or two ounces, varying with the circumstances and condition of the stomach.

“ The extraction is generally attended by that peculiar sensation at the pit of the stomach termed sinking, with some degree of faintness, which renders it necessary to stop the operation.

* The valve at the artificial opening is formed by a slightly inverted portion of the inner coat of the stomach, fitted exactly to cover the aperture. Its principal and most external attachment meets the upper and posterior edge of the opening. Its free portion hangs pendulous, and fills the aperture when the stomach is full, and plays up and down simultaneously with the respiratory muscles when empty.

“The usual time of extracting the juice is early in the morning, before he has eaten, when the stomach is empty and clean.”

There have been great differences of opinion by physiologists and chemists with regard to the exact analysis of gastric juice, but Dr. Beaumont's experiments entirely failed to show any other results than those described by Müller and Schwann of Berlin, which were published in the “Medical Review” for July, 1837.

They were desirous of testing the assertion of Dr. Eberle, that neither mucus alone, nor acids alone, were capable of digesting food, yet that acidulated mucus had that property.

Dr. Eberle supposed that the mucus of any membrane had this effect, when combined with acid, but it appears that it belongs only to that of the stomach.

A portion of the mucous membrane of the fourth stomach of the calf was washed in cold water until no acid taste could be detected in it; it was then macerated, in water acidulated with muriatic acid.

This, when filtered, and slightly raised in temperature, was found to dissolve many alimentary substances, even when the membrane had been previously dried.

Pieces of meat and of hard-boiled eggs are

softened in this fluid in twelve hours, and they disappear almost entirely in twelve hours more. The fluid acquires a peculiar sweetish odour, which is not, however, of a putrescent character.

When the fluid contains no acid, it produces no effect upon food.

Schwann discovered that the strength of the acid remained the same at the termination of the digestion, as it was at its commencement, showing that it does not chemically combine with the particles of food subjected to its action.

The active agent in this process is a compound, called "pepsin" * by Wasman, who obtained it pure from the stomach of a pig, which in its properties nearly resembles that of the human subject.

Pepsin combines with many acids, but the combination still reddens litmus paper; and when united with muriatic or acetic acid, is in its most powerful state as a solvent.

Although an analysis has been made of gastric juice, no artificial combination has yet been found, capable of performing the same office as the fluid taken from the stomach.

From the experience of Eberle and Schwann, however, it is proved that, although acids are not

* Graham's "Elements of Chemistry."

able alone to dissolve meat, yet that when combined with the mucus of the stomach, they acquired that power; and it appears that no other mucus except that of the stomach will have the effect.

Gastric juice is a clear fluid, transparent, without smell, and very perceptibly acid, as well as being a little saltish. It consists of water, with muriatic and acetic acids, phosphates and muriates, with bases of potassa and soda, magnesia and lime, and an animal matter soluble in cold water, but insoluble in hot.

It appears that the quantity of gastric juice supplied, is only equal to the digestion of a certain portion of food; the action of it, “like that of other chemical operations, ceases after having been exercised upon a fixed and definite amount of matter.”

Dr. Combe says, “Chemical solution proceeds most rapidly when small portions of the comminuted solids are successively added, and stirred through the fluid; and most slowly when a large quantity is thrown rapidly in, and not duly mixed with the fluid. In digestion, the precise counterpart of this occurs.

“When the juice becomes saturated, it refuses to dissolve more, and if an excess of food has been taken, the residue remains in the stomach,

or passes into the bowels in a crude state, and becomes a source of nervous irritation, pain, and disease for a long time."

In the stomach, therefore, it appears that the food requires the action of the muscular fibres, in order that healthy chymification may take place; that it requires a certain quantity of gastric fluid, and the presence of heat.

The two latter are indispensable: the absence of the former is the cause of protracted digestion, although the process would without it eventually be performed.

The chyme formed in the stomach varies in consistence according to the food from which it is created. If strong rich food has been eaten, the chyme is thick, like cream; if light farinaceous food has been the diet, then the chyme is thin, like gruel.

After the chyme is perfected in the stomach, it is propelled, by the contraction of the circular fibres of the stomach, through the pylorus into the duodenum. This propulsion is at first slow, and gradually becomes faster as the stomach becomes emptier. Its removal from the duodenum is sometimes retarded, and is supposed to cause many of the more trivial complaints to which the generality of people are liable; such as jaundice, headache, &c. The chymous fluid

does not change its character until it passes the mouth of the ductus choledochus; but at this point the bile and pancreatic fluid mix with it.

Below this opening is commenced the process of absorption by the lacteals.

The chymous fluid having become mixed with these secretions is changed in appearance and character, and becomes chyle, which, by experiments, is proved to be separated subsequently into excrementitious and nutritious principles.

Chyle is said to be "a white opaque substance, considerably resembling cream in its aspect and physical qualities. It is said, however, by most authors, to vary according to the food taken. Dr. Beaumont affirms that pure chyle, taken from the lacteals of a healthy subject, and produced by natural food, is invariably the same substance in the same individual."

In order to try the effect of bile and pancreatic juice upon chyme, Dr. Beaumont performed several experiments,* both on chyme formed by mix-

* 1st Experiment.—"I divided the chyme produced in Experiment 24 (a portion of recently salted beef placed in twelve drachms of gastric juice in a vial, in a sand-bath kept at 100° of heat), into two equal parts, about five drachms each, to one of which I added one drachm of ox-gall (not being able to procure human bile). Fine coagula were immediately produced of a slightly yellowish green colour. To this I then added one drachm

ture with gastric juice out of the stomach, and also on that formed in the natural process of di-

of dilute muriatic acid (instead of pancreatic juice, in the proportion of one scruple of acid to six ounces of water), which immediately produced a white balsamic mixture. This, after standing at rest a few minutes, separated into three distinct parts: a clay-coloured sediment at the bottom, a whey-coloured fluid above, and a thin, whitish, oily pellicle at the top.

2nd Experiment.—This experiment varied little from the first.

3rd Experiment.—Having procured some fresh gall from an ox recently slaughtered, I added twenty drops of it to four drops of chyme; a turbid, yellowish white fluid, or, rather, very fine, cream-coloured coagula immediately formed, which, after standing a few minutes, separated into bright yellow-coloured coagula, subsiding towards the bottom, and a turbid milk-coloured liquid above.

By adding twenty drops more of bile to this, the coagula were increased, more collected together, and changed in colour from a yellow to a greenish hue.

The addition of twenty drops more of bile (making, in the whole, one drachm) concentrated a deep grass green, jelly-like deposition at the bottom of the vial. The fluid above became more milky in appearance, and the coagula and sediment became darker on the addition of bile.

I now added twenty drops of the dilute muriatic acid to other four drachms of the same kind of chyme, without bile. This produced no change in the colour or consistence, but increased the saline acid taste peculiar to the gastric and pancreatic juices when combined with chyme. By adding bile to this, the same effects and appearances were present as in the other similar experiments; viz., a yellowish brown sediment at the bottom, a whey-coloured fluid in the middle, and a white pellicle at the top.

Several other experiments, similar in their general purposes, but varied in the manner of trying them, tend to prove the same results.

gestion, and he found that it was immediately separated into three distinct parts—a “reddish brown sediment at the bottom,” a “whey-coloured fluid in the centre,” and a “creamy pellicle at the top.” He says, “the sediment, from its appearance and the coarseness of its particles, I judge is incapable of being acted upon or being taken up by the absorbents. The creamy or oily pellicle is not only liable to the same objection, but is in too small proportion to the ingesta. The fluid part is fitted, by its fluidity, for the ready action of the absorbents, and is, moreover, in sufficient quantity for the purposes of nutrition. The sediment and pellicle, I apprehend, are both excrementitious.”

That bile is the principal agent in changing chyme into chyle, is made apparent by the experiments of Sir Benjamin Brodie, who tied the ductus choledochus of several young cats, and in none of them was there subsequently found chyle, but all the secretions contained bile.

There are certainly great changes occurring as soon as chyme enters the duodenum in the healthy subject. It loses its acidity, and changes its colour. There is extrication of gas; and this was observed by Dr. Beaumont, in experimenting upon artificial as well as natural chyme. In the stomach, oxygen is found, with some hydrogen

in the intestines, an increased proportion of hydrogen, with carbonic acid and nitrogen, but no oxygen.

The alkali of the bile probably combines with the acid of the chyme; but the subject requires further investigation.

By absorption of the fluid portion of chyle in the duodenum, the intestinal contents become more and more consistent; and as they pass through the smaller intestines they partake, in a greater degree, of the appearance of faecal matter.

It is clear that a part of the faeces is derived from the mucous coats of the bowels, for their contents in animals which have fasted long, and in whom there was no chyle, were found to consist of mucus mixed with bile. No doubt can be entertained as to the possibility of much mucus being present, when we consider how great is the surface from which it can be secreted in the intestines, and that the excrementitious matter necessarily comes in contact with it in its passage to the rectum.

In the foetus this is exemplified by the presence of meconium tinged with bile.

The excrementitious portion of the chyle is carried through the intestines by the same kind of peristaltic action that has caused the chyme to pass from the stomach to the duodenum. This

is materially accelerated by the presence of bile, as has been proved by Sir Benjamin Brodie's experiment of tying the ductus choledochus, where there was always constipation. Hence the immediate purgative effect of mercury, owing to the increase of bile which it produces, and which acts as an irritant upon the intestines.

It is clear, then, that the great principle in digestion is the solution of the gastric contents in gastric juice, and that all the other processes which the food has to undergo previous to the ultimate formation of blood are merely accessories to the chemical solution.

“ Digestion is conformable to chemical solution: first, in the assistance that both derive from the minute division of the solids submitted to it; secondly, in the assistance which both derive from the successive addition of small portions of the comminuted solid to the solvent fluid, and from the thorough admixture of the two by continual agitation; thirdly, in the limitation of the quantity of food on which a given amount of gastric juice can operate, which is precisely the case with chemical solvents; fourthly, in the assistance which both derive from an elevation of temperature; fifthly, in the different actions of the same solvent upon the various solids submitted to it*.”

* Dr. Carpenter : op. cit.

CHAPTER II.

INFANT DIGESTION.

THE difference between digestion in the adult and in the infant will be readily understood ; and consequently, in the food of each, there should be a corresponding difference.

In the infant, the power of masticating and muscular action, two of the most essential requisites to digestion, are both wanting.

As only liquid food is provided for its diet, teeth are not afforded it ; nor does the stomach possess the power which it subsequently obtains, when the delicate liquid secreted for its use ceases to be sufficiently nutritious ; and it would be equally absurd to expect a child to use its legs in walking, from its birth, as to suppose it capable of exerting the involuntary muscular action of the stomach, in the process of digestion, as the adult.

The development of the muscular fibres, and the consequently increased strength of the digestion, will be simultaneous with the appearance of teeth, and will denote that stronger food than

that hitherto given is required for sustaining the system. Under these circumstances, therefore, an exclusively liquid food would no longer be beneficial. Food of a solid kind, such as calls into play the powers of the stomach, will be properly and speedily digested, and the muscular action itself will gradually become stronger by exercise.

This is the case with all muscles: if they remain unused even but a short time, they become attenuated, as in the paralytic limb, which decreases in size in proportion as it is deprived of its proper use; while with moderate and sufficient exercise they acquire strength so as to sustain almost any labour to which they are habitually applied.

Hence, the evident superiority in the size and bodily strength of the drayman over the merchant's clerk.

The latter in his occupation calls no muscles except those of the hands into play; the former is constantly exerting his whole muscular strength.

It is evident, therefore, that highly culpable as is the too prevalent practice of administering to toothless children food of a consistence that prevents their digesting it, a due increase in strength is equally checked and impeded by confining children, who are of an age to digest stronger food, to that which is adapted only to the stomach of the young infant.

The change should, however, always be most gradual, and not, as in the generality of instances, from the weak liquid diet at once to the strong fibrous food of the adult; for, as over action of any muscle tends to weaken and enervate it, so in the stomach a similar effect is produced on the introduction of food which requires an extraordinary and unnatural effort to digest it.

Dr. Beaumont discovered that digestion could not be performed without heat, and upon introducing the bulb of the thermometer into the stomach of St. Martin, that the temperature averaged about 100° ; but he denies most positively that any increased heat is attained by the stomach during the process of digestion. He found, however, that exercise at any time caused the temperature to rise in the stomach; hence he concludes it to be in this respect that exercise assists digestion. And if a certain temperature is essential to digestion, it is obvious that whatever diminishes this necessary degree of heat must retard the process.

Dr. Beaumont once found that the injection of a single gill of cold water at 50° into the stomach, reduced its temperature upwards of 30° , and that its natural heat was not restored for more than half an hour. Hence, the practice of eating

ice after dinner, or even of drinking largely of cold fluids, is very injurious to digestion.

The comparative absence of heat in the infant is a circumstance of much importance as regards its digestion.

In young animals the power of generating heat is very feeble; it differs, however, in regard to the readiness of its formation, in proportion to the general development of each. In Guinea-pigs, which run about independently of their mother directly after birth, the heat generated by themselves is sufficient for their support; whilst young dogs, cats, rabbits, &c., which are born blind, and which for many days from their birth have little more animation than when in utero, rapidly lose their heat when withdrawn from the contact of their mother.

In the human species external warmth is necessary (a fact too often neglected). The development of man is slower than that of any other animal, and his calorifying power is closely connected with his general bodily vigour. A vulgar notion frequently prevails of giving children strength, and making them robust, by exposure to cold: there cannot be a greater error. Without warmth, digestion is impaired, and nutrition necessarily imperfect. The circulation is impeded,

and consequently their growth irregular; the supply of blood to the extremities is checked, and thus the general health suffers.

The circumstances of heat* have a very interesting connection with the results of statistical inquiries, as to the average number of deaths of different seasons recorded by M. Quetelet:—

	First Month.	2 & 3 Years.	3—12 Years.	25—30 Years.	50—65 Years.	90 Yrs. and above.
January	1.30	1.22	1.08	1.05	1.30	1.58
February	1.28	1.13	1.06	1.04	1.22	1.48
March	1.21	1.30	1.27	1.11	1.11	1.25
April.....	1.02	1.27	1.34	1.06	1.02	0.96
May	0.93	1.12	1.21	1.02	0.93	0.84
June	0.83	0.94	0.99	1.02	0.85	0.75
July	0.78	0.82	0.88	0.91	0.67	0.64
August	0.79	0.73	0.82	0.96	0.85	0.66
September	0.86	0.76	0.81	0.95	0.89	0.76
October	0.91	0.78	0.76	0.93	0.90	0.74
November.....	0.93	0.91	0.80	0.97	1.00	1.03
December.....	1.07	1.01	0.96	0.97	1.15	1.29

We see from this table that during the first month of infant life the external temperature has a very marked influence.

* Dr. Carpenter's Principles of Physiology.

As childhood advances, however, the winter mortality diminishes, while that of the spring undergoes an increase: this is probably due to the greater prevalence of certain epidemics at the latter season, for the same condition is observed in a still more remarkable degree between the ages of eight and twelve years, the time when children are most affected by such epidemics. As the constitution acquires greater vigour, and the bodily structure acquires its full development, the influence of season becomes less apparent; so that at the ages of from twenty-five to thirty years the difference between summer and winter mortality is very slight. The difference re-appears, however, in a very marked degree, at a later period, when the general vigour, and the calorifying power, undergo a gradual diminution. Between the ages of fifty and sixty it is nearly as great as in early infancy.

In early age, therefore, owing to the power of generating heat being comparatively feeble, food of easy digestion should be given to the young, and not that which, as well as requiring mastication and muscular motion of the stomach, which the young possess not, cannot be digested except under the influence of the warmth of the body of the adult.

It is scarcely necessary, however, to remark,

that excessive warmth, either owing to too much clothing, or to over-heated rooms, is as deleterious as the effect of cold ; indeed, the latter I should consider less injurious than the former.

CHAPTER III.

FŒTUS IN UTERO.

THE condition of the infant at the moment of its expulsion from the uterus, as well as at a subsequent period, depends in some degree upon its previous state in the womb of the mother, through whose circulation nourishment has been hitherto derived.

It is unnecessary to dwell upon the many absurd notions of the effects upon the child in utero, of frights, passions of the mind, peculiar longings, sudden movements, and extraordinary impressions of the mother; all of which are by women supposed to have some peculiar effect upon the child.

A hare-lip, a nævus, a deficiency of fingers or toes, the position of the umbilical cord round the fœtal neck, a breech presentation, or that of an arm, are at once attributed to something either done or suffered by the mother—to some object seen, read of, or thought about; but such notions, it is almost needless to say, are groundless, and had not the occurrence in question set the

imagination at work to find out a cause, no such ideas would ever have been entertained.

It is not unfrequently the case that a fœtus not having attained an age to withstand any great pressure, becomes subject to the action of the uterus, owing to the escape of liquor amnii, and when expelled dead, is of such a form that it may be said to resemble many most unnatural objects; and thus we may account for the frequent stories of people giving birth to children resembling monkeys, rats, dogs, &c., because, as it is said, they were frightened during their pregnancy by one or other of those animals.

A child may be born with the back of the head wanting; it may be born, having a pointed termination to its body instead of legs; it may have only one arm, or no arm at all, or one leg; or a hand may be wanting, rudiments only of fingers being present: all these malformations, as well as others, and the consequent attempts to account for them, give rise to such opinions as by those who scientifically study the subject are known to be totally at variance with the truth.

That alarms, particularly when sudden, have effect upon the fœtus in utero there is no doubt, and one or other of these results may follow,—either labour commences prematurely, or the supply of blood is suddenly, and for an instant pro-

bably, cut off from the child by spasmodic action of the uterus, and its death is the consequence.

Grief will often occasion premature labour or the death of the fœtus.

It has been stated by authors, that the general health of the mother, the mode of living, and the constitution, have effect upon the child. This is true as concerns the latter circumstance, but debility of the mother, depending solely upon her being badly fed, or owing to protracted illness, will generally influence the child but little; and I am enabled to state this from my own personal experience in the Queen Charlotte's Lying-in Hospital, to which are admitted probably as ill-fed and as emaciated a class of patients as are to be found in any institution of the kind, and there is no exception to the rule, that the most emaciated and enfeebled woman, whether from starvation or from drunkenness, or some phthisical affection, will give birth to a child as robust and healthy as that of any person whose means, and health, and inclinations, have enabled her to be well fed, and equally well clothed.

It has been stated by Quetelet, that distress of mind and want of personal comforts have a great effect in causing the death of children in utero; and he says that, at Berlin, "the still-born, out of 100 illegitimate births, were, during the half

of the preceding century, three times more numerous than the still-born out of 100 legitimate births:" and this state of matters is not yet improved.

This seems, however, remarkable, when compared with the results found upon referring to the books of the Queen Charlotte's Lying-in Hospital, where there are wards for the reception of unmarried women; and taking any five hundred cases, I find that the number of still-born children of the unmarried exceed only by one or two those born of the married women.

By the laws of the hospital, single women are admitted only once, and it may be concluded that the small excess of dead children among the unmarried women is accounted for by the fact that they are all first labours, in which there is a greater liability to the production of dead children than in others, from the resistance offered to the expulsion of the child, and from the long duration of the labour.

Upon the mother, however, the effect of grief and distress is very evident, for although the deaths in the Queen Charlotte's Hospital only average about two in every three hundred, a large majority of these belong to the single women. Widows, also, in giving birth to posthumous children, often suffer severely, and the list for the

last half century shows many deaths amongst that class of patients.

This mortality in the Queen Charlotte's Hospital cannot but be considered small, when it is known that in many instances the patients have no means of subsistence, otherwise than in the workhouse, after their dismissal from the hospital; that they are admitted frequently in a deplorably emaciated and debilitated state; that the single women, before their seduction, had lived in comparative affluence, and that their prospects for the future are those of wretchedness and poverty.

Some women are even admitted with diseased lungs, and death ensues upon their delivery; others come into the hospital actually suffering from diseases over which, of course, the medical officers can have no control, until their admission; for, with the very best intentions to forward the charitable purposes of the institution, those who manage its arrangement are unable to make provision for destitute women until the appearance of their labour pains. If they were previously admitted, they might be inmates for weeks, for their poverty would very often induce them to misdate their calculation as to their period of pregnancy, in order to gain shelter and food.

Women who are constitutionally weak, and

have languid circulations, will give birth to children of feeble natures: thus parents with red hair and blanched skins will produce children having the same characters; and robust parents, with dark eyes and hair, will give birth to children having the like features: but this is very different to the constitutionally strong, but accidentally debilitated woman.

It is very much the custom of authors to compare children born in the cottage with those born in the palace, and to say how well the former, and how ill the latter, appear to thrive. Now such is not the case. In certain parts of the country, the race of labourers and of poorer people is certainly wonderfully robust, but no estimate is made of the number out of the same families who have died in infancy.

It should be remembered that a child's death in a cottage is to the public generally but little known, while a similar occurrence in a higher class attracts much greater attention; and again, with regard to the health of families, the children of the poor are quite as sickly, if not more so, than those of the rich.

It is a fact worthy of notice, that many poor boys are seen with enfeebled limbs and emaciated bodies, while their faces appear robust and healthy; but, in higher life, nothing of the kind is to

be met with, or at least rarely. The limbs of the children of richer parents are generally well-proportioned and muscularly developed, although their faces may be, in some instances, pale, and of delicate appearance.

It is too frequently supposed that if a pregnant woman is well fed her child will be large in proportion, and that the contrary will be the case if the woman is but sparingly nourished; and with this view many injure themselves by excessive eating. Without enlarging upon the bad results of this practice, I venture to say that were the real truth known, it would be found that a considerable number of the cases of puerperal convulsions were the result either of over-feeding or of eating indigestible food; to the same cause may be attributed the inflammatory attacks both before and after labour, and many other of the inconveniences from which pregnant women suffer.

That the practice is a mistaken one has been clearly shown by the circumstances related as occurring in the Queen Charlotte's Lying-in Hospital.

In some instances it is necessary that increased food and tonic medicines should be given to sustain the gradual diminution of strength which takes place in pregnant women, otherwise their

systems might not be able to support the lives of themselves and their offspring.* In these cases medical aid should be sought, nor can any one be justified in following the advice of women or uneducated persons in cases where life may be at stake. I have seen emaciation occurring and women sinking, from what was supposed to be simple debility, all the most nutritious food being given, and yet the strength continuing to fail, in consequence, as it afterwards proved, not of weakness but of plethora, and this not in a single instance only.

These instances, and others which occur during pregnancy, are most convincing proofs of the want of interference by the legislature, to prevent women and ignorant practitioners giving attendance in midwifery.

There is no accounting for the infatuation which induces women, at other times apparently possessing excellent judgment, to put themselves in the hands of uneducated pretenders, and to suffer themselves to be misled by certain vague theories, and a mysterious affectation of wisdom

* In many instances I have known the first sign of pregnancy to be the loss of general health, or absorption of fat, even before other circumstances proved it, the finger rings being much looser than usual upon the fingers, and sometimes dropping off.

which seems to captivate the fancy ; still more extraordinary is it, that men, and moreover affectionate husbands, should deliberately trust their wives to the treatment of such persons. They promise themselves, no doubt, that should any apparent danger arise, medical assistance can be summoned. But let them take warning from the many cases which occur to every experienced practitioner, where the unhappy patient dies under the sufferings of labour needlessly protracted ; or, when all danger is seemingly over, sinks under the attack of some neglected or undetected disease.

No praise can be too great for the coroners of the metropolitan county, who have made it a rule to hold inquests on the bodies of all women who die in childbed when attended by females, unless certificates from qualified practitioners are produced to the district registrar. If death ensues under surgical operation in the hands of an empiric, he is exposed to the penalties of the law, and surely the same protection should be extended to women under the operation of delivery, where the attendant is frequently placed in a more critical position than even in the severest operations of surgery.

But not only do husbands trust the lives of their wives to these ignorant persons, but to their care also do they commit their children, and too

often, it need scarcely be said, do they see cause to repent of their folly ; when they find diseases rendered incurable, and the constitution permanently injured, by the quackery of an ignorant attendant, in cases which require the utmost care of an enlightened and experienced practitioner.

There seems, however, to be a prejudice in the public mind against the prosecution of those who, possessing no qualification, are instrumental in the deaths of their fellow-creatures : if brought to trial, they are always acquitted.

It is true that there is a power vested in the Society of Apothecaries to prosecute those who exercise the practice of medicine with pharmacy without their licence, and until the medical profession was placed by the late government in the unsettled state in which it now remains, much benefit was derived from it ; but no means are now adopted to check the presumption of the host of illegal practitioners who infest the metropolis, and who, day by day, defy the law in exercising homœopathy, hydropathy, mesmerism, &c.

The next subject that calls for observation is the period of pregnancy, at the termination of which the fœtus, having arrived at maturity, is expelled from the uterus, and from that time is dependent upon the assistance of others for all its wants ; sometimes it comes into the world pre-

maturely, and at others is erroneously supposed to be premature, owing often to a want of knowledge of the exact time of utero-gestation.

It is usual to consider nine months as the period; and this vague sort of calculation leads to many mistakes and misstatements; for it often happens that women's own accounts are listened to and believed, without minute inquiry of any kind being instituted; a correct knowledge, however, of the circumstances ought always to be obtained.

The delicacy of the subject renders it difficult in some cases to obtain a true account of the first pregnancy, but if any annoyance is felt at the questions which it is necessary to ask, it may generally be attributed to the manner in which they are proposed to the patient. On no occasion is more care and nicety required; and I do not hesitate to say, that by proper management in this most delicate of all subjects, no woman, however strong her feelings, need experience the slightest annoyance even at the most intimate investigation.

The duration of pregnancy is nine calendar months and a week, or forty weeks; or, if calculated by days, the number would be 280. There will of course be a variation of a day or two, according to the months that are included.

The best way is to calculate from the middle period, or a fortnight after menstruation. In some few instances I have known labour protracted until the last day on which it could happen, or nearly ten months from the time of the last menstrual period, showing that pregnancy had not occurred until the day before the next menstruation would have taken place.*

The period of quickening may be relied on to a certain extent, but is generally only a guide in conjunction with other circumstances ; certainly it should not be considered alone.

The time of quickening is about four months from the beginning of pregnancy.

It may happen a little earlier or a little later, and it may take place in the same person earlier in one pregnancy than in another.

No children live unless they have completed the seventh month of gestation.

They may survive a few hours, or even a day or two, but then they become exhausted and die. If born after the seventh month the chances are in favour of their living, but great care and attention to feeding and to warmth is called for, or inevitably they will not survive.

* It is probable that cases similar to these have given rise to the supposition, that gestation can be protracted, or, rather, that pregnancy continues more than forty weeks.

The means used to cause women to continue with their pregnancy when habit and other causes have appeared to render it hopeless, are now so well understood and successfully applied, that it is but seldom they fail to promote this most desirable object.

The oftener abortion or premature labour occurs, the more difficult will be the prevention in future; but the various causes of these occurrences, the states of system of women who suffer from them, the condition of the ova themselves, have of late years been so scientifically studied, and with such good effects, that I trust, should I at any time record the cases that have come under my care, I may be able to show that they are equally under medical control with any other more ordinary complaints to which the human frame is liable.

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CHAPTER IV.

INFANT AT BIRTH.

IMMEDIATELY after the birth of a prematurely born child, care should be taken to procure a wet-nurse, or some woman with a very small nipple to suckle it.

The nurse is necessary in order that the child may immediately be nourished by natural food, instead of waiting for the appearance of the mother's milk; and one with small nipples should be procured, because if they are large the child will not be able to enclose them within its lips.

There is a prejudice in favour of children born at seven months living, and against the surviving of eight months' children: this, however, is totally unfounded, for it is a fact ascertained beyond doubt, that the seven months' child has a less chance of living than that born at eight months, and the latter less than the child at the full period; but with care, both the seventh and eighth months' child will be equally likely to live.

The following touching description of the con-

dition of the new-born infant is from the pen of Dr. Combe. "In one instant it is transferred from unconscious repose, solitude, darkness to life, and light and action. From being surrounded by a bland fluid, of unvarying warmth, it passes at once to the rude contact of an ever changing and colder air, and to a harder pressure, even from the softest clothing, than it ever before sustained. Previously nourished by the mother's blood, it must now seek and digest its own food, and throw out its own waste. The blood, once purified and restored through means of the mother's system, must now be oxygenated by the child's own lungs. The animal heat once supplied it from another source, must now be elaborated by the actions of its own organs. Formerly defended from injury by the mother's sensations and watchfulness, its own nerves must now receive and communicate the impressions made by external objects ; through its smile or its cries, it must now announce to her ear, and reveal to her judgment, its safety or its danger ; and if any of these important changes fail to take place in due time and order, its life may fall a sacrifice."

Supposing now the infant fairly launched into the world, the next point that claims our attention is its proper nourishment. And here it is

impossible to impress too urgently upon the minds of mothers, the importance of attending strictly to the course which nature points out for their guidance; any deviation from this, except under peculiar circumstances, if it does not actually shorten the life of the child, would most likely materially affect its general health and progress towards a state of manhood. It will be observed that the skin of the child thus suddenly exposed for the first time to the effect of the atmosphere, is extremely tender, and it may fairly be concluded that the internal membranes are equally so, and liable to suffer from irritating and improper food.

The first object of nurses, after having clothed the child, is to put into its mouth either some castor oil, or some butter and sugar; the first is used by nurses who wait upon people of the better ranks of life, the latter amongst the lower orders: both of them act as purgatives, and in that view they are given, in order to remove the meconium which the intestines contain at birth.

As this practice is generally productive of neither good nor harm, it has been permitted, and is a matter of as regular arrangement as any connected with a lying-in room, but under only one circumstance is it really necessary, and that is, when the

mother of the child, from some cause or other, is unable to suckle it.

The milk that is first secreted is thin and watery, and acts as a purgative upon the infant's bowels, by which the meconium is removed: after the first day or two it no longer has this quality, but is simply the natural and beautifully adapted food of the infant.

If the mother suckles her child, there is no need of artificial purgatives; if not, then a small quantity of oil is of service, as the milk from a wet nurse's breast no longer continues to be purgative, for she necessarily will have been delivered some three or four weeks previously to the birth of the child she is engaged to suckle.

The next object of nurses is to pour down the child's throat some kind of food, generally that which it has the greatest difficulty in digesting; gruel is commonly chosen, the effect of which is to produce flatulence, oppression, and pain. Hence the infant is constantly complaining, and a quantity of dill-water, which always is to be seen in a lying-in room, is added to the still undigested gruel. At length the child becomes purged, or vomiting relieves it from its troubles: this process is again and again repeated until the mother's milk is secreted, and the child obtains that food which nature has prepared for it,

and which alone, without failing, always agrees with its power of digestion;* but here again is nature often interfered with. The nurse imagines that the child does not get enough, or that too frequent an application to the breast must fatigue the mother, or that she ought not to be disturbed from her sleep; and on one or other of these pretences she repeats the cruel discipline, succeeded by the same train of symptoms, until at length the child becomes emaciated and suffers from constant diarrhœa: the mother, from disturbance at night, owing to the cries of the child, becomes ill, and the medical man is told that the mother is unable to nurse: perhaps he is imposed upon by the combined assurances of both nurse and mother, for she, poor thing! believes what the nurse tells her, and with tearful eyes expresses her conviction that she has not enough milk.

To those experienced in the practice of midwifery all these difficulties will be got over. It is only necessary to assure the mother that her power to suckle is good, and to insist upon the child having no artificial food, and the natural process of nutrition is again established. The mind of the mother becomes easy, her milk re-

* I only refer to the larger number of ordinary nurses: there are many nurses in London who may fully be relied on for their ability in the care of children.

turns in ample quantities, and the child begins once more to thrive ; nor probably would it ever have failed to do so, except for the mistaken interference of the monthly nurse.

In order to demonstrate the irritability of the mucous membrane of a newly-born infant, it is only necessary to refer to the readiness with which aphthous spots appear in the mouth and fauces, indeed throughout the whole canal ; and these will always be produced by feeding the child with gruel or other unnatural food. This complaint is known by the name of “ thrush,” and is often spoken of by nurses as of great importance, and young mothers are alarmed at it ; although in truth it is not of the slightest consequence in the greater number of cases.

The disease (if it can be called so) consists in certain little elevated spots of a redder colour than that of mucous membrane generally ; these become little pustules, and leave upon the surface small ulcers having a white deposit upon each, which nature secretes, in order to defend the denuded spot from the irritation of food as it passes to the stomach.

It is thought highly necessary by nurses that the “ thrush” should “ pass through the child ;” that is, that every part of the whole length of the

intestine should be affected by it, and that the nates should partake of the same irritation. Nothing of course can be so absurd as this: it would be well if the absurdity were confined to these notions, but unhappily a great many nurses actually proceed to wipe off the crusts, as they call it, two or three times a day; by which process the sores are denuded and made liable to be irritated by anything taken into the child's mouth.

After the birth of a child, it should be allowed to sleep for any length of time that it may be inclined, and no immediate necessity exists for food, either artificial or from the breast; indeed, had its birth taken place unattended by the refinements of society, food could not have been provided for it until the secretion of the milk. It will, however, be better to allow the child to suck within twenty-four hours, in order that it may become familiar with the process, and also that encouragement may be given to the secretion of milk. It tends also to relieve after pains, which sometimes give much uneasiness.

The secretion of milk is sometimes deferred until the end of the third day; and I have known in many instances children to go entirely without food until that time without any inconvenience; but this is not always desirable, and provided the child's natural food is imitated as far as possible.

no harm will result from a little artificial nourishment. The nearest approach to the mother's milk is made by a mixture of cow's milk and water, in the proportion of equal parts of each. This should be taken by suction, and the child should not be urged to take more than it is willing to swallow of its own accord.

There are two modes by which children are attempted to be brought up—the one by natural means, the other by the sole use of artificial food ; under the former they are almost sure to thrive, the latter is invariably doubtful, almost always a failure, and very frequently the cause of death.

Dr. Marshall Hall says, that he “ made a point of ascertaining the mortality amongst dry-nursed children, and that it amounts to seven in ten. In the country it is somewhat less.”

The artificial means that are employed, vary according to the inclination or the prejudice of the nurse or the mother ; but in the greater number of instances the character of the food chosen is directly at variance with what nature dictates.

The better kinds of food are those that most nearly resemble the mother's milk, and they consist of cows', of asses', or of goats' milk. On vegetable food, a toothless child, even if it lives, is never satisfactorily reared ; it either produces dyspepsia and fever, or diarrhœa, emaciation, and death.

Under this head are comprised the whole race of what is called "farinaceous food," such as biscuit powder, baked flour, and gruel, arrowroot, barley food, and bread in various forms. These, it is needless to say, are totally unfitted for the infant's stomach, whose capability of digesting food is only adapted to the bland fluid which its mother's breast secretes, and which requires but little effort to convert it into blood.

After all, no imitation can be expected to possess the same nutritious powers as that which nature affords in the milk of the mother, so beautifully adapted to the purpose. "In some very northern parts of the world," says Dr. Marshall Hall, "as those of Greenland and the neighbouring country of the Esquimaux, the breast appears to be, in the strictest propriety of speech, the only food that nature has provided for infants, inasmuch that whenever a suckling mother happens to die, her infant is buried with her."

"Experience," (one would hope), says Dr. Marshall Hall, "having demonstrated the inefficacy of hard and coarse diet, which nature has so sparingly dealt out, it is esteemed an act of compassion to put an end to an infant's sufferings, by plunging it into the sea."

CHAPTER V.

PRINCIPLES OF FOOD.

THE food of man is derived both from the vegetable and animal kingdom; and it has of late been shown, by Liebig's analysis, that the chyme formed from each of them contains very nearly the same principles.

The essential ingredients of all food are certain chemical principles called fibrin, albumen, gelatin, oil, gluten, and sugar, either in combination or alone. It was said by Hippocrates "that there are many kinds of aliments, but that there is at the same time but one aliment;" and the discovery of Liebig goes far to confirm this.

It is related by Mr. Mayo, that when Dr. Franklin was a journeyman printer, he lived for a fortnight upon bread and water, at the rate of ten pennyworth of bread a week, and that he found himself stout and healthy with this diet.

Sir John Pringle knew a lady, then ninety years of age, who eat only the pure fat of meat.

The Laplander feeds exclusively on animal food, the Hindoo on vegetable diet.

Dr. Prout* says, “that all organised bodies contain one or more of three staminal principles, viz. the saccharine, the oleaginous, and the albuminous.

The saccharine, in which are included sugar, starch, and gum, &c., are chiefly obtained from vegetables. The oleaginous are obtained from animals as well as vegetables, and may be found in various states of consistence.

“Albumen is obtained from animal bodies in conjunction with gelatin and fibrin, and it contains a fourth principle, called azote. The proportions of gelatin, albumen, and fibrin, are found to be very different in different animal bodies, and in the several parts of the same body: thus fibrin is the principal part of muscle, gelatin of the skin, and albumen is in the greatest quantity in other parts.”

A mixture of two at least of these staminal principles is necessary for the carrying on of life, as proved by Majendie, who found that a dog fed upon sugar alone, or upon gum, or upon butter, seemed at first to thrive, but in a few days it began to fall away, became emaciated, and died; he supposed that this was the result of the want of azote in the food. Mr. Mayo thinks it was owing to the singleness or concentratedness

* Bridgewater Treatise.

of the aliment, but Dr. Prout attributes it to the want of combination of another, or of both the other staminal principles of food.

Neither sugar nor gum, which are the pabulum of vegetables, will alone sustain life, nor will albumen and gelatine, when uncombined with other matter: and these bear the same relation to animal bodies, that sugar and gum have to vegetables; but albumen, combined with a very minute proportion of osmazone (which gives the flavour to meat), will sustain life for any length of time.

Dr. Prout says, that as all the more perfect organised beings feed on other organised beings, their food must necessarily consist of one or more of these three staminal principles of organization. Hence, it not only follows that in the more perfect animals all the antecedent labour of preparing these compounds *de novo* is avoided, but that a diet, to be complete, must contain more or less of all the three staminal principles: such at least must be the diet of the higher classes of animals, and especially of man.

It cannot, indeed, be doubted that many animals on an emergency have the power of forming chyle from one of these classes of aliments; but that any of the higher animals can be so nourished for a length of time, is exceedingly improbable. Nay, if we may judge from what is known by ob-

servation, as well as by experiments of physiologists upon food, we are led to the opposite conclusion, namely, that the more perfect animals could not exist on one class of aliments ; but that a mixture of two at least, if not of three staminal principles, is necessary to form an alimentary compound well adapted to their use.

“ This view of the nature of aliments is singularly illustrated and maintained by the familiar instance of the composition of milk : all other matters appropriated by animals as food, exist for themselves, or for the use of the vegetable or animal, of which they form a constituent part. But milk is designed and prepared by nature expressly as food ; and it is the only material throughout the range of organization that is so prepared. In milk, therefore, we shall expect to find a model of what an alimentary substance ought to be ; a kind of prototype, as it were, of nutritious materials in general. Now every sort of milk that is known is a mixture of the three staminal principles we have described ; in other words, milk always contains a saccharine principle, a butyraceous or oily principle, and a caseous or strictlyspeaking an albuminous principle. Though in the milk of different animals these three staminal principles exist in endless modified forms, and in very different proportions, yet neither of

the three is at present known to be entirely wanting in the milk of any animal.

“Of all the evidences of design in the whole order of nature, milk affords one of the most unequivocal. No one can for a moment doubt the object for which this valuable fluid is prepared ; no one can doubt that the apparatus for the secretion of milk arose from the wishes or the wants of the animal possessing the apparatus, or from any fancied plastic energy. On the contrary, the rudiments of the apparatus for the secretion of milk must have actually existed in the body of the animal ready for development, before the animal could have felt either wants or desires. In short, it is manifest that the apparatus and its uses were assigned and made what they are, by the great Creator of the Universe : and on no other supposition can their use be explained.”

Dr. Prout proceeds : “The composition of the substances by which animals are usually nourished, favours the mixture of the primary staminal alimentary principles, since most of these substances are compounds of at least two of the staminal principles.

“Thus, most of the gramineous and herbaceous matters contain the saccharine and the glutinous principles, while every part of an animal contains at least gluten and oil. Perhaps, therefore, it is

impossible to name a substance constituting the food of the more perfect animals, which is not essentially a compound of at least two, if not of all the three great principles.

“ But in the artificial food of man we see this great process of mixture most strongly exemplified. He, dissatisfied with the spontaneous productions of nature, culls from every source, and, by the force of his reason, or rather by his instinct, forms in every possible manner and under every disguise the same great alimentary compound. This, after all his cooking and his art, how much soever he may be disinclined to believe it, is the sole object of his labour, and the more nearly his results approach to this object the more nearly do they approach perfection.

“ Even in the utmost refinements of his luxury, and in his choicest delicacies, the same great principle is attended to ; and his sugar and flour, his eggs and butter, in all their various forms and combinations, are nothing more or less than disguised imitations of the great alimentary prototype *milk*, as furnished to him by nature.”

CHAPTER VI.

MAMMÆ.

THE minute structure of the mammary gland consists of about twelve ducts, leading from the extremity of the nipple to its base, and there forming a number of reservoirs in which milk is constantly held during lactation, to supply the immediate wants of the infant, during the time necessary for the secretion of milk after it has been applied to the breast, and to induce it to make exertion in sucking, sufficient to obtain that which is newly secreted.

It is very likely the absence of milk in these reservoirs which causes the not unfrequent disinclination in children to make further effort, beyond their first attempts at suction.

These are much larger in many of the lower mammalia than they are in the human female.

From each reservoir proceed five or six branches of the lactiferous tubes; each of these spreads out into innumerable divisions, greatly multiplied, but much diminished in size, until they ultimately terminate in little cells, contained

in minute glandules, of which the mammary gland is composed.

The orifices of the ducts at the extremity of the nipples are smaller in size than the ducts themselves.

The whole of the ducts and cells of the gland are lined with a very highly vascular mucous membrane, which during pregnancy secretes the clear mucus that is seen to ooze from the nipples.

The lactiferous tubes rarely inosculate; and hence, in the first place, owing to their vascularity, inflammation supervenes upon the slightest irritation, and owing to the want of inosculation no direct means are afforded by collateral branches for their relief, when an accumulation of milk occurs in any of the minute ramifications.

The mammary gland itself is composed of a number of the glandules united by the fibrous tissue of the breast.

At the time of pregnancy, the blood-vessels supplying the gland become much enlarged, and remain so during lactation; their minute branches are much distributed upon the cells. They convey the blood from which milk is secreted by the glandular arrangement of the breast, and from the cells the milk carried by the tubes to the ducts of the nipple.

The cells are copiously supplied with absorbents,

which, by removing the thinner portion of the milk, render it more consistent and nutritious; they serve also to remove the milk from the vessels during a prolonged absence of the infant, or when, from its early age or other causes, the quantity secreted is more than the child can withdraw.

It sometimes happens that children are affected by diarrhœa, or are found to digest the milk too readily; the appetite is not fully appeased, and in consequence they are almost constantly at the breast: thus the milk is drawn off and becomes food for the child, before the watery parts have time to be absorbed by the lacteals, and owing to its diluted state is either taken up too quickly from the stomach, or passes at once into the bowels.

A longer interval between the times of suckling will in general be the cure

The mammary gland, although rudimentally formed even during fœtal existence, does not become developed until about the thirteenth year of female life; it then gradually enlarges until the twentieth year, when it attains the full maturity of its virgin state.

Upon the occurrence of pregnancy, pain and enlargement are perceived in the gland; the blood-vessels increase in calibre, and the areolæ of the

nipples, which before have been of a rose tint, and very delicate, become dark in colour, and owing to the enlargement of the papillæ the surface of the skin assumes an unusually coarse appearance.

This is one of the strongest evidences of pregnancy; still, like almost all the apparent signs of pregnancy, it does not by itself amount to certain proof; the concurrent testimony of other symptoms is required, in order to justify a decisive opinion; for in many instances it has happened that the alteration from single to married life has produced a similar and deceptive change: and some women who have remained single longer than the usual period have even before marriage exhibited the above mentioned discoloration of the nipples, while, on the other hand, married women may be seen with the rose-coloured areolæ even after the production of children.

In old age the mammary gland disappears; its place being supplied with adipose tissue, which still maintains the form, although the arrangement is destroyed.

On the first appearance of the secretion of milk after labour, there is generally some considerable excitement of system, which is usually recommended to be treated by the same method in all instances. That the proper treatment,

however, differs in different individuals, that it varies in the same person under a change of circumstances, and that opposite modes of treatment may at various times be required, every day's experience more fully confirms.

The time for the appearance of milk varies considerably in different persons. It often appears as early as twelve hours, frequently not until twenty-four, and very often it does not become secreted until thirty-six or forty-eight hours after the termination of labour; the "third day" is considered a critical time, as being that on which milk is first secreted.

Its appearance is denoted by a pricking sensation and heat of the breast, which increases to positive pain, extending under the arms; the suction of the child at once brings relief, and in a day or two from what is called the "height of the milk," the process of lactation is fairly established.

The use of purgatives in diminishing not only the general irritation produced throughout the system, during the commencement of the secretion of milk, but in moderating the actual quantity secreted, is evident; but it is frequently lost sight of by practitioners, whose object simply is to empty the intestines of the fæculent matter they contain.

This is no doubt very necessary, but there are other points of equal importance, which must be effected by means of purgatives, and should therefore be kept in view in the choice of them.

Oleaginous purgatives are supposed to act upon the intestinal canal without irritation, and on this account are often valuable aperients.

In the case of a weak and irritable patient, or one in whom the mucous lining of the intestine is affected, either by common inflammation, or the peculiar irritation of dysentery, oleaginous purgatives should certainly be preferred; for the same reasons that, after operation for hernia, it is always desirable that they should be administered in preference to others. But it is a great mistake to employ them universally, as the only purgatives to be administered after labour.

Suppose, for instance, a woman is of full habit, and that upon the secretion of milk her pulse becomes full, her tongue furred, her face flushed, and the skin in general heated and dry; here oily aperients would be of very little avail; and should they be administered alone, in all probability these symptoms would increase, inflammation would supervene, and copious bleeding must be resorted to to save her from destruction.

To prevent this result, saline purgatives should invariably, in such cases, be employed; their

well-known effect dictates their use in the instance of plethora, as evidently as it contra-indicates it in that of emaciation and debility.

Saline purgatives cause liquid secretion from the glands of the intestines: by diminishing in quantity the fluids of the body, they tend to lessen inflammatory action, to allay excitement of system, and effect at once a reduction of the hardness and painful distension of the breasts.

In some cases, so exhausted from constitutional causes are women after labour, that it is advisable to prescribe tonic purgatives, such as rhubarb, combined with stimulants and aromatics, whose action may rather promote than diminish the circulation. Our selection, then, of purgatives, after labour, is to be made between these three kinds:—

The simple oily aperient, which only acts upon the contents of the intestines as it passes through them;

The saline aperient that moderates the circulation, tranquillises the system, and reduces the quantity of milk, thus preventing inflammation;

The tonic and at the same time stimulant purgative, which tends to increase the tone of the circulation.

It appears, then, that the use of purgatives is of no small importance, and acquires a larger

share of attention and discrimination than is usually given to it by many who practise midwifery.

In seven out of every ten cases the saline purgative is required, and the more extensive use of it by those who have hitherto administered none but the oily kind, will be found to produce these beneficial effects : it will in a great measure prevent the inflammatory attacks which now continually happen, and inflamed and suppurating breasts will be of comparatively rare occurrence. At the same time, we cannot too carefully guard against the promiscuous use of saline purgatives ; valuable as they are in cases where plethoric symptoms are to be reduced, they are not less mischievous and dangerous in the opposite condition of debility.

On the third day from labour, a purgative of some kind should generally be given : some difficulty in effecting an evacuation will frequently occur. I am then in the habit of ordering the repetition of the purgative every four hours until effect is produced ; and I usually prefer the ordinary black dose, consisting of salts, manna, infusion and tincture of senna, with or without ammonia, according to the state of the patient.

Should the patient be desirous of suckling her own child, this dose may be repeated in a day or

two, afterwards, unless plethoric symptoms show themselves, a milder medicine, such as castor oil or a Seidlitz powder, may be prescribed daily or every other morning, according to the state of the alimentary canal.

Where the mother does not suckle her infant, it will be advisable to repeat the above dose daily, until the secretion of milk is fairly subsiding; subsequently it may be taken on alternate mornings, and then gradually disused, and a pill of colocynth or extract of jalap, or some purgative of this nature, may be substituted. These, however, must be avoided during the first fortnight after labour. They principally affect the lower bowels, and thus the irritation would be extended to the uterine organs, to which they are contiguous, and which require, on the contrary, a soothing treatment.

In ordinary circumstances, the power of the child in sucking is sufficient to cause a free escape of milk from the nipple; but occasionally, owing to the feebleness of the newly-born infant, or to the small calibre of the milk tubes, it is extracted with difficulty. Here it will be necessary to make use of the efforts of an older child, and when once the tubes are emptied the milk will continue to flow.

Sometimes, again, the nipple has been so com-

pressed by the clothes, that a young infant cannot elongate it so as to obtain a hold, and in such case it may be advisable to have recourse to the power of an older child.

A certain degree of tension, causing more or less pain from the accumulation of milk, is always to be considered as a sign of health; for, like other secretions of the body, if inflammatory action is going on, or any febrile excitement more than usual after labour, the secretion of milk will be retarded. Indeed, the prolonged or total absence of milk calls for great caution in the treatment. Some women, it is true, never have milk; but these are rare cases. I have known instances in which no symptoms of even an attempt at the formation of milk were perceived by the patient after any of her labours, and others where the milk secreted amounted only to a few drops; in all these cases the mammæ were but imperfectly developed. The subjects were, in other respects, healthy, nor have their labours been attended with any untoward results.

With regard to the propriety of mothers suckling their own children there can be but one opinion, except where they are compelled to relinquish it by causes over which they have no control.

It is too generally asserted by writers on this

subject, that women are induced to neglect this duty to suit their own convenience, and to avoid the restraint which it imposes ; but I do not hesitate to say such conduct is by no means general ; and that even when common observation indicates the propriety of forbearance on their own account, it is difficult to impress this necessity upon them even by the strongest medical authority ; and this is found in all ranks of society.

A great many of the impediments to a healthy and satisfactory suckling arise from the over refinements of living ; and to these may be attributed not only the local difficulties, but those which are caused by constitutional derangement.

During the process of lactation, women are subject to few casual illnesses of importance, except such as may be induced by improper suckling ; and it is no small encouragement to undertake an office, the evident tendency of which is to preserve the female in a state of health.

If the mother is strong and healthy, and the mammae well developed, she ought decidedly to suckle her infant ; and to continue to do so, until the state of the child denotes that it no longer requires that kind of nourishment, or until she begins to suffer and becomes weakened from the effect of the secretion of milk. There may, however, be causes of a local or constitutional charac-

ter which may render her totally unfit to undertake the office of nourishing her infant.

There may be actual disease, or such a state of health as to render the mother liable, with the least additional loss of general power, to pulmonary attacks : in such a case nothing should induce her to suckle.

In women who have glandular enlargements in the neck, it is always found that suckling increases the disease ; as would anything that reduces the strength, and causes additional irritation to the already irritated glands.

The treatment for such cases would be to uphold the system by tonics and increased diet ; and to forbid the indulgence of any habit, or any kind of exertion, that would tend to weaken the enfeebled constitution. Suckling, under such circumstances, would be evidently improper.

If there is general debility without local symptoms, it would, again, be equally unwise to suckle ; for, although local evidences of disease may be absent at the commencement of suckling, the drain made upon the system will in all probability call forth latent complaints.

Often nature seems to provide for her own security, and refuses to aid the mother's determination to suckle ; the power to secrete a sufficient

supply of milk fails, and the attempt is necessarily abandoned.

But exceptions are met with ; and in cases of debility more milk will be secreted by some women than can be consumed, and a woman is, under these circumstances, vulgarly said to “run to milk :” she becomes dreadfully emaciated, but as long as the child thrives she is insensible to her own condition, and delighting in the progress it makes, is induced to persist, till at length the actual appearance of disease compels attention to her state, and medical aid is sought for when too late to be of use.

In some women the *quantity* of milk is deficient, in others *quality*. There may be a copious supply, and yet the child who imbibes it may not be nourished ; so that a large supply of milk affords no certain proof that the child is well provided for.

The recurrence of pregnancy at an early period of lactation, occasions a diminution of the secretion ; and at a later period, a total cessation of it.

It is not often that pregnancy occurs during the early time of suckling, especially in women whose supply of milk is copious and in all respects healthy.

The menstrual discharge does not usually ap-

pear till the period when nature indicates that she has done her part, and that the child must seek its food elsewhere; and almost always when a menstrual discharge appears, pregnancy supervenes. The breasts have ceased their healthy secretion of milk, and the uterus in consequence has become fit for conception.

When women menstruate during lactation, the milk usually undergoes at the period a certain change which sometimes, though rarely, has an injurious effect upon the child.

Hence, in the choice of a wet nurse it is always considered desirable to procure one whose menstrual periods do not occur during lactation.

Amongst the local preventives to suckling the most frequent is the occurrence of inflammation of the breast, followed by abscess: this is generally the result either of soreness of the nipples, which through the pain attending it prevents the mother from permitting the child to suck sufficiently to exhaust the milk tubes, and thus they become distended and inflamed; or it may arise from some prolonged interval between the applications of the child to the breast, or from the accidental accumulation of coagulated milk in the tubes.

Owing to the pressure of the stays and other clothing, the nipple is so flattened that it is, as

has before been mentioned, with difficulty elevated from the breast, and the skin in the folds formed by this process of flattening is of course very tender; the drawing out of the nipple produces cracks or fissures, and these are often most troublesome to cure.

Every time the child is applied to the breast it opens afresh these fissures; and no sooner is it removed than the clothes pressing against the nipple close the wounds and the edges begin to unite; but before the union can be complete, the child again separates the parts, and thus they are continually irritated and inflamed, till at length the pain becomes so intolerable that the woman cannot suckle; upon this follow accumulation of milk, and inflammation, to which, if not at once counteracted, abscess inevitably succeeds.

Innumerable remedies have been applied to these sores, almost all of them of an astringent kind; such as zinc in ointment or lotion, nitrate of silver in water, preparations of lead in ointment and in lotions, which should be washed from the breast before the child is applied. The water into which the hot horse-shoes have been thrown at the blacksmith's forge, is said to have great effect, from the astringent nature of the particles of iron it contains. Other applications of a stimulant character are used, such as spirits of wine.

or brandy and water, and others whose effect is to sooth, and to defend from the air, such as powdered gum arabie, sprinkled upon the craeks, both before and after the application of the child.

It may be remarked, that any of these, except the last, will be of the greatest use when combined with other remedies: but they can be of little effect when used alone, and as long as the causes of irritation are suffered to continue. All writers agree in representing the frequent application of the child to the breast as the sole cause of all the suffering and inconvenience that arise from sore nipples: this, however, is not the case; the child alone could do no harm whatever. It is the pressure of the clothes, however light, that produces all the mischief.

Among savage tribes, where women are living in a state of nature, no such thing as sore nipples or abseess is ever found; because there is no compression of the nipples by articles of clothing; the nipple with them is prominent, and at once ready for the mouth of the child.

Astringent lotions would probably by degrees have the effect of contracting the sores, and healing them from their surfaces: but there is no time to accomplish this during the continued irritation of the closing and re-opening of the

wounds ; and inflammation of the breasts is the result.

It will be observed, then, that the mode of cure will be to prevent pressure of the clothes after the child has been withdrawn ; or in other words, to keep the nipple in the prominent position in which the child leaves it when it has ceased to suck.

For this purpose, nothing answers better than the limpet-shell found on the sea shore, but it should be a very large one, and not flat but deep.

There are numberless “ shields ” made with the view of curing this troublesome complaint, but none of them act upon the principle I have mentioned ; none of them, therefore, will be found effectual.

I have formed a shield of the shape required for the purpose, and given it to Mr. Thompson, the surgeon’s instrument maker in Great Windmill Street, who supplies my patients with similar contrivances, and I have found them most successful.

They resemble as nearly as possible the limpet-shell, enlarged, so as to prevent even the slightest pressure by the internal surface on the extremity of the nipple.

The effect of this upon the fissures is to keep them entirely open ; to separate their edges, in

fact, so as to prevent the attempt to heal by union, and thus leave them to be cured by a much more speedy process ; it also prevents the formation of cicatrices, which will always be liable to be again divided.

In addition to this protection, the astringent applications will be found serviceable in giving a healthy character to the sores, and in accelerating the process of cure.

The delicacy of women, who are averse to any examination or exposure of the breast, creates a difficulty in ascertaining the state of the nipple previous to delivery ; when this can be overcome, the means of preventing sore and compressed nipples are easy and effectual.

Together with inflammation of the breast, there is also great derangement of system, with flushed face, shivering, quick pulse, and circumscribed pain in one or other of the breasts ; owing to the peculiar structure of these glands inflammation soon terminates in suppuration, and abscesses of very large size not unfrequently occur.

Purgatives should always be given upon the first sensation of circumscribed pain, and continued every twenty-four hours as long as the inflammation lasts ; if these fail to remove the local affection, leeches should be at once applied.

In spite however of these precautions, suppu-

ration will often follow ; and as soon as fluid can be detected it will be necessary to change the treatment recommended for inflammation. Light nutritious food may be given, and poultices may be applied instead of cold lotions ; and as soon as there is the least approach of matter towards the surface, a puncture should be made in order to allow its escape.

The pendulous nature of the breast has often the effect of giving to the cavities left after abscess a wide and gaping appearance ; but it is astonishing how quickly these openings, however large, will granulate and fill up, leaving not only no trace of where the damage has existed. but not even causing, by cicatrices or other alteration of parts, any impediment to the free secretion of milk after subsequent delivery, nor to its extraction by the child.

In some few instances, when the abscess is small and superficial, the woman may continue suckling, provided it is freely opened, and the discharge of matter not long delayed. The speedy discharge of matter is necessary, because if it does not find an outlet by an artificial opening, it will be likely to escape through the milk tubes, and the child will swallow purulent matter together with the milk.

All secretions of the body, such as urine.

saliva, and perspiration, are liable to be checked by disease: it is not surprising, then, that the secretion of milk, which resembles them in the mode of its formation and in the glandular arrangements by which the process is performed, should be interrupted by the various diseases incident to childbirth, such as puerperal fever, peritonitis, phrenitis, and convulsions; where, if the secretion is not altogether checked, the quantity is too small for the proper nourishment of the child.

When a wet nurse must be procured, every pains should be taken to select one who seems suited to the purpose, both in other respects, and particularly in having a good constitution; otherwise the bad quality of the milk will soon render a change necessary; and though changes may do no real harm, they should be avoided, on account of the aversion which most children have to take the breast of strangers.

A wet-nurse should be robust, her skin free from spots, her teeth good, and her hair should be dark: this last precaution is not suggested on account of any of the absurd notions with regard to red-haired women, but because red or very light hair indicates a slow circulation and a weak habit, both of which are reasons for supposing a woman

to be incapable of effectually suckling an infant entrusted to her charge.

A wet-nurse should have large, hard, and prominent breasts; the nipples also should be prominent; and when the breasts are squeezed, milk should freely flow from all the orifices of her milk tubes.

The temper of a wet-nurse should always be good, as any irritability may affect the milk, and this frequently repeated may be of serious consequence to the child.

Sir Astley Cooper* says—"The secretion of milk proceeds best in a tranquil state of mind, and with a cheerful temper; then the milk is regularly abundant, and agrees well with the child. On the contrary, a fretful temper lessens the quantity of the milk, makes it thin and serous, and causes it to disturb the child's bowels, producing intestinal fever and much griping. Fits of anger produce a very irritable milk, followed by griping to the infant, with green stools; grief has a great effect on lactation, and consequently upon the child.

"The loss of a near and dear relation, or a change of fortune, will often so much diminish the secretion of milk as to render adventitious aid

* "Researches on the Mammary Gland, and its Secretion."
By Sir A. Cooper.

necessary for the child. Anxiety of mind diminishes the quantity and alters the quality of the milk. The reception of a letter which leaves the mind in anxious suspense, lessens the draught, and the breast becomes empty. If the child be ill, and the mother is anxious respecting it, she complains to the medical attendant that she has little milk, and that her infant is griped and has frequent green and frothy motions. Fear has a powerful influence on the secretion of milk. I am informed by a medical man, who practises much amongst the poor, that the apprehension of the brutal conduct of a drunken husband will put a stop for a time to the secretion of milk.

“ When this appears, the breast feels knotted and hard, flaccid from the absence of milk, and that which is secreted is highly irritating. and some time elapses before a healthy secretion returns. Terror which is sudden, and great fear, instantly stop the secretion. Those passions which are generally sources of pleasure. and which, when moderately indulged, are conducive to health, when carried to excess alter, and even eventually check the secretion of milk.”

CHAPTER VII.

MILK.

THE first secretion of milk bears a different character to that subsequently secreted, both in its proportion of ingredients, its appearance upon inspection by means of a microscope, and its effect upon the stomach of the infant.

It is called colostrum.

Dr. Donné* says, "healthy milk examined with the microscope contains globules of various sizes perfectly spherical in form, with black and regular borders, and they swim freely in a fluid in which no other particles are suspended."†

It appears that the colostrum contains some real milk globules, but they are irregular and disproportioned; some of them appear like large oleaginous drops, and are not like true globules.

The majority of the other globules in the colos-

* British and Foreign Medical Review.

† "Healthy milk contains generally about 80 per cent. of water, 4 to 7 of casein, 3.5 to 5.5 of butter, and 3 to 5.5 of sugar of milk and salt."—Gregory's Outlines of Chemistry.

trum are very small, and are joined together by means of a viseid matter.

The colostrum differs from normal milk in containing 15 to 25 per cent. albumen, with less casein, butter, and sugar of milk.*

The colostrum also contains some particles of a yellowish colour, like small grains, which seem to be fatty matter; and a peculiar mucus. After the first excitement attending the secretion of milk has subsided, the granules daily disappear, and the regular milk globules become regular in shape and of one size; and those which had been adherent by means of the viseid matter, become separated, and move about independently in the fluid.

These changes sometimes take place later, and even at an advanced period of lactation have not always disappeared. Dr. Donné has observed this in lean and ill-fed women, but at the same time the milk in appearance is perfectly healthy.

The effect of this early milk is purgative: and if this state of things continues long, may produce serious consequences to the infant, and by causing incessant diarrhœa, reduce it to an extreme state of emaciation.

The secreted milk may be called food ready

* Gregory.

digested by the mother, for the nutrition of her offspring. It undergoes but little change before its absorption by the lacteals of the infant, and is in its bland consistence and ready digestion, as well as in its chemical combination, the only food that ought properly to be administered.

If we consider the mode adopted by animals not mammiferous, we shall find that their way of feeding their young is by bringing the food into such a state in their own stomachs, that little remains to be done by the young, more than mere absorption. The pigeon, for instance, retains its food until it becomes chyme: it then, by a kind of vomiting, ejects it from its own stomach, and it is received by the young bird, whose beak is introduced for the purpose within that of the mother.

In this manner almost all birds provide for their young at the very early periods of life; they convert the food first into chyme, and then feed their young with it.

In mammiferous animals there is no necessity for this; their mammæ perform the same office for their young as the stomach of the pigeon and other birds, and milk is more easily converted into blood than any other kind of food whatever.

The appearance of healthy human milk is that of a bluish-coloured liquid, of watery consistence,

and free from any smell." Dropped into water it forms a light eloudy appearanee, and does not sink at once to the bottom in thiek drops.*

The secretion of milk is water holding sugar, and the other ingredients before mentioned, in solution ; in which oleaginous globules with partieles of a form of albumen, termed easein, are suspended.

If the milk of any animal is allowed to stand exposed to the air, separation of its eomponents takes plaee ; and thus result many of the produets, such as eream and eheese, used for domestie purposes.

In the first plaee, the oleaginous partieles of milk rise to the surfaee, not alone, but eombined with some albumen, with the sugar and salts of the milk. The eream thus formed is freed from these latter ingredients by agitating (or churning), and the result is butter, eomposed of the oleaginous principle, and butter-milk, eontaining the sugar and saline ingredients with albumen. The butter, however, is not quite free from albumen, which is the cause of its beeeoming rancid when kept too long. The milk, after the eream has been removed, still retains the greatest part of its albumen and sugar, but if kept for

* Dr. Combe.

any lengthened period it undergoes decomposition by the conversion of the sugar into lactic acid ; the albumen is coagulated by it ; and thus are formed the flakes that fall to the bottom of milk that is said to be sour.

The albumen or casein of milk, however, is not acted upon by all acids, as ordinary albumen would be, but rennet, or the acid proper to the stomach of the calf, has a peculiar effect in coagulating it so easily that one part will coagulate 1800 parts of milk. This property is not found in the stomach of older animals, which most clearly demonstrates the intention of Providence in ordaining this food especially for infant life—an intention more strikingly marked by the fact, that the acid of the stomach alone has the power of forming light flocculent coagulæ from milk—other acids causing it to coagulate so tenaciously that, in experiments made by Dr. Beaumont, it was proved that milk coagulated by acetous and other acids took forty-eight hours to digest, while that formed by gastric juice required only eight.*

Then, the slowness with which the rennet acts upon milk in perfecting the peculiar coagulation

* These experiments were made out of the stomach, and without agitation.

required, is another evidence of design in its adaptation to the power of digestion in the young animal, thus enabling the stomach to digest by degrees, instead of being rapidly filled with many indigestible coagula.

It has already been stated, that milk contains three staminal principles, — the albuminous, oleaginous, and the saccharine. For the description of the chemical characters of each, I am indebted, as also for many observations on this subject, to Dr. Carpenter's "Principles of Physiology."

The oleaginous matter of milk principally consists, like fatty matter in general, of the two substances elaine and stearine, which are converted in the process of saponification into the elaic, stearic, and margaric acids. But it also contains another substance, peculiar to it, which yields in saponification three volatile acids of strong volatile odour, to which Chevreul has given the names of butyric, caproic, and capric acids, whilst the fatty substance itself, to which the peculiar smell and taste of butter belong, is designated as butyrine.

The casein or cheesy matter of the milk, which is obtained with some slight admixture of fatty matter, in the production of cheese from skimmed milk, is commonly stated to be chiefly distinguished from albumen by the peculiar readiness

with which it is precipitated by acetic acid, and by its solubility in an excess of the precipitant : the casein of the human subject being, however, much less precipitable by acids, than that of the cow.

The sugar of milk, which may be obtained by evaporating whey to the consistence of syrup, and then setting it aside to crystallise, contains a large proportion of water (12 per cent.), so that it may be considered as really a hydrate of sugar.

The saline matter contained in milk appears to be nearly identical with that of the blood, with perhaps a larger portion of the phosphate of lime and magnesia, which amount to 2 or $2\frac{1}{2}$ parts in 1000.

Milk is the only secreted food that contains the saccharine, the butyraceous or oily, and the caseous or albuminous principle, and is the only article supplied by nature ; that contains the three : how outraged, therefore, are the intentions of nature, when artificial food is given to children, and the breast abandoned ! for in the provision made by nature ; is found a food so beautifully combined in its constituents and proportions, that no imitation has ever succeeded in producing a fluid ; at once suited to the infant's weak digestion, and to its effectual nourishment.

In milk, we not only find the three staminal principles, but we find also the addition of saline ingredients ; without these it would be impossible for the bones to acquire their solidity ; and the want of them is often seen in artificially-fed children, whose limbs, in consequence of this deficiency, are unable to support the weight of the body, and become distorted.

The phosphates of lime and of magnesia therefore form a most important part of milk, as regards the proper nourishment of infants.

Dr. Rees has noticed, that of all secreted fluids milk is most nearly allied to the composition of blood ; it is as nearly allied to blood as are the constituents of chyle. There is therefore required no mastication, no muscular action of the stomach, but simply the action of the gastric juice, to convert the milk into flocculent coagula, which are most readily absorbed by the lacteals.

The following table explains the comparative resemblance of the ingredients of the blood to those of milk :—

Coagulum.	BLOOD.		MILK.		Cream.
	Fibrin.		Casein.		
	Red particles.		Butyraceous matter.		

	BLOOD.	MILK.	
Serum.	Albumen.	Casein.	Skimmed Milk.
	Alcoholic extractive, viz. lactates.	Alcoholic extraction, viz. lactates and acetic acid.	
	Aqueous extractive, albuminate of soda.	Aqueous extractive, with sugar of milk.	
	Alkaline salts.	Alkaline salts.	
	Fatty matter.	Fatty matter.	

The relative proportion of the different ingredients in the milk of different animals, according to the following tables, is well shown. A knowledge of them is highly essential in the feeding of infants ; and only to ignorance of these matters can we attribute the obstinacy of nurses and mothers, and even those whose education should have taught them better, which induces them to persist in giving children food, containing albumen doubly concentrated, when nature has prescribed for them nutriment containing less albumen than is held, in the usual quantity for a meal, of any other kind of diet.

The cream of human milk was found by Sir Astley Cooper to vary in proportion to the milk, from one-fifth to one-third of the whole volume, the larger quantity being given by well-fed women free from mental anxiety, and at an early period of parturition.

	Woman.	Cow.	Goat.	Sheep.	Ass.	Mare.
Casein.....	2.50	4.48	4.02	4.50	1.83	1.62
Butter.....	5.18	3.13	3.32	4.20	.011	traces.
Sugar of milk and aqueous extractive }	6.52	4.77	5.28	5.00	6.08	8.75
Saline matter		0.60	0.58	0.68	0.84	
Water.	85.80	87.02	86.80	85.62	91.65	

} 89.63

The milk of the cow, the goat, and the sheep, do not differ much from each other; that of the ass and the mare are different, however, from the others, and the mare's milk is so saccharine, that the Tartars prepare spirit from it which they call "Koumiss."

Mare's milk is not used in this country, or no doubt it would be found highly nutritious for infants.

The milk of the sheep and the goat both possess a much larger portion of casein, which forms so strong a coagulum, that it is with difficulty the human stomach can digest it. The milk of the goat is also tainted with the smell of the animal, which is stronger if the goat is dark-coloured.

Human milk contains less casein than any, with the exception of the ass and the mare, and as the small quantity of casein is the great feature in the human milk, which renders it more easy of digestion in the stomach, and more nutritious. so it is probable, from the same cause, that asses' milk

comes next in point of the nourishment it affords to infants.

The small quantity of casein in asses' milk, and the great proportion of water, will be convincing arguments in favour of diluted food, in preference to that which is concentrated.

In illness of children, when no medical treatment avails, and the continuance of diarrhœa, vomiting, fever, or inflammatory affections, seems to have banished all hope of recovery, the exclusive use of asses' milk will of itself perform the cure : and it should always be administered if the child has long been weaned, and when, from other circumstances, human milk cannot be given.

Any one who is in the habit of attending to children's diseases will bear witness to its efficacy ; nor can they have failed to notice the almost immediate cessation of urgent symptoms, the return of healthy evacuations, and the commencement of increased vigour, and deposit of fat, that follow the exhibition of asses' milk. In a day or two, or even in a few hours, beneficial changes will sometimes take place.

It is, however, not always easy to procure asses' milk. In London, the animals are kept solely for this purpose ; and it may at all times be obtained. But in the country, it is often different.

and if the animals are found, it is not everybody who can milk them.

Those who are constantly used to it will readily obtain the desired quantity ; but others, who are ignorant of the nature and disposition of the animals, often fail. I am told, however, that if the young donkey is kept mostly apart from the mother, and just before the time of suckling brought into her company, she will readily yield her milk.

Care is required also in feeding donkeys ; for I have known them bought and taken into the country, and so well fed there, that the milk became too rich, and curded so strongly, that instead of being digested, it was retained in the stomach, and caused illness ; but by returning to a poorer diet the difficulty was removed.

No limit need be put upon the quantity of asses' milk given to children : they should take it as often as they wish for it. Generally, however, a child of one year old will drink, if in health, from two to three pints in a day, or perhaps more : older children may eat a rusk, or a piece of toast with the asses' milk, and then the same quantity will be sufficient for them as for the younger child.

But the extravagant charges made for asses' milk in London, deter many people from buying

it; and for those whose means do not allow them to purchase it, the milk of the cow, much diluted, will be the best substitute.

When a child is fed upon cow's milk, it should be so diluted as to resemble, as much as possible, that of the human species, directions for which are given in the chapter on Feeding.

CHAPTER VIII.

MANAGEMENT OF WOMEN DURING LACTATION.

THE quantity of milk that is ordinarily produced by the human breast is not actually known, for that which is artificially drawn is no criterion, because it is at the time of suckling the “draught” occurs—that is, a quantity of blood is carried to the breasts for the purpose of affording to the gland the power of secreting from it milk for the meal of the child; but usually about two ounces can be squeezed from the breast, which had been contained in the tubes and reservoirs.

The amount secreted is necessarily dependent upon the health and vigour of the woman: and here some few words may be expended in noticing the effect of food upon the secretion of milk.

Perhaps in no other country are more erroneous ideas entertained with regard to the food of women at the time of suckling.

The object of nurses immediately after the delivery of a woman, is to pour down her throat certain drinks which they suppose go directly to the

breasts, and from which, without any intermediate process, milk is to be formed.

Because cow's milk is like human milk in general character, that is to say, because the colour of the two are alike, so milk swallowed by the mother is supposed of course to form milk ; it is almost needless to repeat, that neither milk nor any fluids of the class, have a direct agency in this respect, but by creating dyspepsia, and a certain degree of fever, are more likely to diminish the quantity of milk, which, if not interfered with, would have been healthily secreted.

Milk, like all other secretions of the body, is formed from the blood, by means of the mammary gland, as has before been observed ; the cells of which are highly vascular, and therefore are enabled to cause a rapid secretion at the time that it is required.

When, therefore, a woman has not her proper quantity of blood, she has not the power to suckle her infant ; because, although the mammary glands may be perfectly well suited for the secretion, they have not the material from which to form milk.

All nourishment in this case, that would go more readily to form blood, would cause an increased secretion of milk ; those foods, therefore, that are the easiest digested will here have the

greatest effect ; and, as probably, if the circulation is weak, the digestion also is weakened, light nutritious food will be of more service than that which is so strong that even the stomach of a healthy woman would have difficulty in disposing of it.

Malt liquor is considered an indispensable addition to the diet of suckling women in this country ; and indeed, in most cases it is necessary, but often is highly injurious.

In weak women, who eat but little, and depend upon the effect of malt liquor for the formation of milk, much harm may be done by it.

The heart is stimulated to carry blood through the vessels more quickly than it would otherwise be able to do ; and, as the mammary glands are thus well supplied, their functions are performed ; but it is at the expense of the woman's constitution, who is not taking nutritious food sufficient to make up for the great drain made upon her, and is daily, or even hourly, losing what little strength she had, till at last milk sufficient for the child is no longer secreted, or she becomes emaciated and exhausted, and the commencement of a train of symptoms is established, which terminates in disease, from which, perhaps, she may never recover.

Such is the history of very many cases.

I do not say that porter or other malt liquor should be altogether forbidden—far from it; it may be necessary, but with it should be taken food of easy digestion, and when they are required tonic medicines to enable the stomach to digest it, proper exercise without fatigue, change of air, and a certain degree of rest from the too frequent applications of the child to the breast.

Where there are decided symptoms of a mother's inability to nurse her child, she ought to be at once recommended to abandon it, and not suffered to prolong an ineffectual attempt, to the injury of herself and the infant.

Still the mother's fatigue may be partially relieved, without having recourse to the extreme.

At night a long interval may be procured, during which she may recruit her strength, and thus become, during the day, a better nurse than if she were harassed continually by the repeated calls of the child.

Under these circumstances, she would be enabled to suckle her child very late at night, and again very early in the morning; but during the night the child might receive from the nurse, without disturbing the mother, some diluted cow's milk, which should always be taken from a bottle: such a meal will never have any bad effect.

Women may have all the external appearances denoting strength and power to secrete healthy milk, at the same time that the secretion may be improper for nutrition and deficient in quality. Others are there, who appear to have no power to secrete either quantity of milk, or milk of proper quality, and yet their children will thrive much better than those of the robust-looking women.

There may be two causes for the unhealthy supply of milk in stout and apparent healthy women; sometimes it arises from plethora, sometimes from the slowness with which blood is supplied to the *mammæ*, owing to languid action of the heart.

Upon examining the state of the pulse it will often be found that the circulation is oppressed and comparatively stagnant: hence but little supply of blood is afforded to the *mammæ*: almost invariably, such women, although plethoric to the greatest extent, are increasing their quantity of food and malt liquor, in order, as they erroneously suppose, to assist the formation of milk. They are in fact diminishing its quantity by these means: they require saline purgatives, a decrease in the quantity of stimulants, or total abstinence from them, and in some instances it is necessary to extract blood from the arm. Upon this treat-

ment, a greater secretion of milk will follow ; the heart being freed from its overloaded condition, now acts with vigour upon a smaller quantity of blood, and a more free circulation is established throughout the system, and in the vessels of the mammary glands.

The future treatment will be adapted to the existing state of things. Not unfrequently, after protracted nursing, the same person requires a very different regimen.

On the other hand, when, with an externally robust appearance, there is an unhealthy supply of milk, owing to weakness and general languor, then a different mode of treatment is required.

We meet with persons of robust appearance who are far from being really strong : a large and heavy figure, and a plentiful deposit of fat, denote sometimes a languid and imperfect circulation ; and when, from an investigation of the constitution, this has been ascertained to be the case, tonics should be administered, malt liquor should be drunk, and such food eaten as will readily digest, and contains a more than ordinary quantity of nourishment.

Exercise (not fatigue) is here of absolute importance ; general warmth should be maintained in the body ; there ought to be no long interval

between meals ; and the bowels should be regularly, but not purgatively, acted upon by vegetable rather than by saline medicines.

We often find women of this class drinking quantities of fluids—gruel, milk, barley-water, and other such things, believing that more milk will in consequence be secreted.

No fallacy is greater than this ; the fluid weakens the digestive organs, and causes an improper formation of chyle, which is converted necessarily into unhealthy blood.

In those whose health gives way under too large a secretion of milk, it will be found that tonics and astringents have very great effect in checking the quantity, and thus preventing so great a drain upon the system.

It arises in fact from debility of the vessels supplying the breasts, and which, from repeated child-bearing or other causes, have become unduly relaxed.

I have found almost invariably that this state of things at once yields to the exhibition of mineral acids with bitter infusions—the sulphate of quina in infusion of krameria, with sulphuric acid ; or to the different preparations of iron.

It has been already observed that malt liquor, owing to the languid condition of people in refined society, is generally required in this coun-

try ; but that it is not always so is evident from the not unfrequent occurrence of persons nursing their infants for a protracted period, as it is termed “upon gruel,” which simply means, that they do not drink beer ; the gruel having had but little if any effect at all upon the milk. If these women had taken malt liquor, they would, perhaps, have been attacked by apoplexy, or would have had an ill supply of milk, from congestion of blood in the blood-vessels.

If, after all that can be done, the milk is still deficient in nourishment, or positively injurious to the child, partaking too much of the nature of cows’ milk in the quantity of casein it contains, and if tonics in the one case, and purgatives and a low diet in the other, have failed to reduce it to a proper consistency, it will be better at once to urge the abandonment of any further attempt of the mother to suckle, and a wet-nurse should be at once procured.

The erroneous notions regarding the effect of medicines and food upon milk are numberless.

Some women think it necessary to abstain from every food which they imagine to contain acid ; they avoid all fruits and vegetables ; and should by chance anything happen to the child during the time of suckling, it will invariably be attri-

buted to some transgression of the mother in respect of food.

Of late years these notions have certainly been less prevalent; but should it be necessary to administer purgative medicine, of whatever kind, the cries of the child on the following day, are sure to be attributed to the effect of the medicine upon the milk.

It appears that saline compounds, when they are of the most soluble nature, pass into the milk as they do into other secretions; but there are exceptions to this rule. Common salt, the sesquicarbonate of soda, sulphate of soda, iodide of potassium, oxyde of zine, trisnitrate of bismuth, and oxyde of iron, were readily detected in the milk, when these substances had been given to an ass for the purpose of experiment; but vegetable purgatives, such as castor oil, senna, and colocynth, have but little effect upon milk. It is supposed that mercury given to the mother will remove a syphilitic taint in the child, but it is absurd to imagine that a single dose of blue pill can have any effect upon it through the milk.

The regimen of a nurse should be that exactly which it would be under any circumstances, in no way having reference to lactation. If more food, and of a more nutritious kind, is required, medi-

cal advice should be sought, and the nature of the food requisite, as well as its proportions, should at once be learnt.

Women know not the laws of nature ; they therefore should obtain the assistance of those who, from education and acquirements, are conversant with its laws.

It is looked upon as an act of folly, when one, ignorant of the rules of architecture, pretends to direct the complicated arrangements of a large building ; nor would any one but an engineer presume to meddle with the construction or repair of a steam-engine : is it reasonable, then, to suppose that the derangements of the human constitution, often of an obscure and ambiguous character, can be remedied and corrected by any but those whose time has been employed in scientific research into the causes and treatment of disease ?

“ An adult in full health,” says Mr. Mayo.* “ requires two substantial, and often without prejudice partakes of two additional slight repasts in the twenty-four hours ; women, more delicately organised, eat sparingly, and require three meals in the day.

“ Of the two hearty meals which are necessary

* *Philosophy of Living.*

to men, use has determined that one shall principally consist of farinaeous, the other of animal food ; and that the beverage with the first shall be coffee, tea, or cocoa ; with the second, malt liquor or wine : some points in this arrangement are arbitrary, others essential. The beverage at breakfast used to be, and might as well now consist of, beer. Coffee might be, indeed in many countries is associated with, the second repast in place of other stimulants ; but if either repast is to be heavier than the other, and to be taken with wine, it is judicious to throw it late in the day, when the hours of ordinary business are past.

“ The whole of this arrangement is so far arbitrary that the dinner might be, with advantage, as light as the breakfast.”

Women in this country seldom eat much at breakfast, and their dinner is also generally light, for a hearty meal has been taken in the middle of the day at the usual time of luncheon, when, in consequence of the slight breakfast, the appetite becomes keen, and thus not more than one substantial meal is made during the four-and-twenty hours.

This is not a proper practice at any time, and is particularly objectionable in the case of those who suckle their children. Then there is another

bad habit, very common in the higher ranks of society, of lying in bed through the early part of the day. There is nothing that tends so much to produce loss of appetite, general uneasiness, and disinclination for exertion, as rising late from bed—unless, indeed, the greater part of the night is spent in activity of some kind or other, and then a longer time is of course required for rest. Sometimes it may be rendered necessary by constitutional debility, or other such cause; but most commonly late rising is nothing more than an idle habit of dozing away the morning hours, and is debilitating and relaxing to the greatest extent. In some persons the remaining in bed only a few minutes after waking, is sufficient to produce a sense of weakness, and great depression of spirits. If, indeed, they can really sleep to a late hour, and rise immediately upon waking, no discomfort is felt; but if, waking at an early hour, they continue in bed in a recumbent position till the usual time of rising, then weariness and other uncomfortable sensations ensue.

It is astonishing how many bad cases of hypochondriasis are cured by attention to this point. The most melancholy thoughts and depressing anticipations from which people continually suffer, and for which medical treatment seems to

afford no relief, may often be removed by early rising; and where it is practicable and the constitution will bear it, a few minutes' walk before breakfast will increase the beneficial effect.

There are many who are practically ignorant of the benefits to be found in early rising, and who, from long custom, invariably lie in bed some hours after they are awake. They would, however, be amply repaid for the trouble of breaking this bad habit, by the general healthiness and vigour of mind and body which would result from it.

Some, dreading the effect of the cold morning air upon the skin, remain in bed till the atmosphere is warmer, and thus encounter double suffering from cold and damp. During the whole day afterwards it is astonishing how little those persons complain of cold, or suffer from the diseases which result from it, who rise early and as soon as they are awake; they can endure almost any extent of cold. In the voyages recently made into high northern latitudes, where the sun did not rise for three months, the crews were made to adhere with the greatest punctuality to the habit of retiring to rest at nine, and rising at a quarter before six;* and they en-

* Dr. Whewell's "Bridgewater Treatise."

joyed, under circumstances the most trying, a state of salubrity quite remarkable.

The quantity of sleep required by grown-up people ranges between four and nine hours, and depends in some degree upon peculiarity of constitution.

With some the mind and body work quietly, and without irritability; others, going through the same round of business or amusement, are more exhausted, and require longer sleep. But use has much to do with this, and the common error is to suppose a much longer period of repose necessary than health actually requires.

Upon waking from the first sleep we are able to arise refreshed,* but if an idle inclination to sleep again be indulged, this second slumber is often attended by a free perspiration, and we awake relaxed, heavy, and exhausted.

Women require more sleep than men; those of the nervous and sanguine temperaments, more than the phlegmatic and bilious. Persons under training sleep from eight to ten hours.†

* General Elliot, who was extremely abstinent, living upon bread and rice and water, never slept more than four hours out of the twenty-four. Frederick the Second and John Hunter slept five.

† I may here refer to a well-known living example of the benefit of this rule, in the advanced age attained by an illustrious personage, whose faculties are still in full vigour, and who is said to have through life adhered to the practice of rising as soon as he awoke from his first sleep.

Those who sleep nine or ten hours from indolence, probably sleep less concentratedly, and have not the same intensity of repose, as others who, sleeping only when it is necessary, drop asleep at once.

Rising early and immediately after sleep causes an appetite for food, and if women would bear this in mind, a wholesome and nutritious, instead of a meagre, miserable, breakfast would always be eaten.

The great cures performed, as it is supposed, by means of the waters of the foreign and English spas, are in reality, in the majority of instances, the effect of altered habits.

Physicians at a watering-place find little difficulty in prevailing upon their patients to rise early and walk some distance, in order to drink a certain quantity of water, which they persuade them must be taken before breakfast; but the advice of a London physician to his patients to rise early and walk in Hyde Park would be utterly disregarded. The very act of going to a watering-place produces some change in the usual habits, and then the procuring the water is an inducement to exertion.

Sometimes, so long a time after waking is occupied in dressing, or other matters, that the appetite, which at first was good, begins to fail, and

debility from long abstinence takes away all desire for food. Under these circumstances, some nourishment should be taken directly upon waking, but not in such quantity as to interfere with the full enjoyment of breakfast.

A small biscuit or piece of bread, a little warm milk and water, a cup of tea or coffee, and when the circulation is languid, and a general feeling of exhaustion and of cold is experienced, some milk, with a table-spoonful of rum, will be of much use in preventing this peculiar loss of appetite, and a healthy meal will generally afterwards be eaten.

The breakfast of a woman during lactation should consist of bread or toast, with an egg very lightly boiled, or only warmed through, for if it is coagulated too strongly, it is probably one of the most indigestible things that could be eaten. A slice of ham, of broiled bacon, or tongue, will assist the appetite.

If the bowels are sluggish, brown bread may be eaten, which will, where simple action is required, answer the purpose.

Black tea is to be preferred to green, but both are bad, and should not be taken by persons with weak digestion, or who are constitutionally languid. There is no good procured from drinking tea; the green tea may be a little stimulating,

but the heat of the water with which it is made is the sole cause of its stimulating effect.

Mr. Mayo says, "to make tea, let the quantity of a breakfast-cupful and a half of boiling water flow upon the tea, and pour the infusion out in two minutes." By this means you have all the flavour without too much of the bitter principle.

A large breakfast-cupful with the first meal is all that should be taken ; more produces debility of system and of stomach.

Coffee is to be preferred to tea, as having a really stimulating effect ; and therefore it does not cause so much flatulence and discomfort, as the hot and relaxing draught of tea. Cocoa is preferable to either tea or coffee, nor is the richness of it any real objection to its use, as it may be easily remedied by making it thinner and weaker ; indeed, it is too much the custom to make cocoa so thick, that the oily particles are drank in such large quantities as to create indigestion and its consequences.

The advantage of cocoa over tea or coffee is clearly denoted by its appearance ; it is drank warm like these, it has an equally agreeable flavour, and instead of being a limpid infusion, it is a thicker oily fluid, highly nutritious.

Its nutritive qualities have been fully tested in the Model Prison, at Pentonville, where the quan-

tity of meat is considerably less than in other prisons, and cocoa is substituted for it, and in this prison the average illness is much less than in others.

The dieting of the prisoners, I believe, was arranged by Dr. Fergusson and Sir Benjamin Brodie, who are both members of the prison committee.

The next meal, if intended to be merely luncheon. in the middle of the day, should consist simply of a biscuit, or a glass of ale or wine.

By pregnant women, and those suckling, it is often as well that a biscuit and a glass of wine should be taken about eleven o'clock.

According to Mr. Mayo, "the true principles to regulate the repast of dinner are moderation and variety; to dine one day on a single dish, on another on several; one day to make cold meat the principal part of dinner, another to shun it.

"As a general rule, all pastry and puddings should be avoided; the diner has already had enough, and they in themselves are less digestible. A single glass of beer at dinner, or three glasses of sherry, Madeira, or port, afterwards are, amply sufficient."

I cannot agree, as a general rule, that puddings are to be avoided; a mixture of animal and

vegetable food is always desirable, and although, to a certain extent, this is obtained by eating bread and vegetables, together with animal food, yet no bad result ever follows the addition of simple puddings, of tapioca, sago, rice, or bread. Pastry ought to be avoided, it is always indigestible ; but fruit is not included, as is often supposed, in the prohibition of pastry ; it is by no means generally unwholesome, and for women suckling it is of great service, from its gentle aperient properties, and very frequently supersedes the necessity for medicines. Stewed pears or plums, roasted apples, preserved fruits in small quantities, as well as ripe pears, peaches, and other sabaeid fruits, may all be eaten in place of pastry ; boiled rice may be combined with the cooked fruits, or toasted or fried bread may be substituted.

In recommending beer and wine for dinner, of course it is impossible to lay down any absolute rule, but in the ordinary course of things, a woman who is suckling should drink either two glasses of beer, whether ale or porter, and no wine, or one glass of beer, and from one to two glasses of wine.

The hour of dinner should not be later than six, if breakfast is at nine o'clock.

It is a common custom of the present day to

take tea and a biscuit, or something of the kind, at four or five o'clock, and provided no heavy luncheon has been eaten the habit is a good one.

It prevents the stomach becoming languid during the long interval between luncheon and dinner at the usual late hour; and as nourishment is not so much the object, tea may do very well.

The old established custom of taking tea after dinner is a mere habit, and of no sort of benefit; the dinner has been but recently eaten, no time has elapsed to allow of its digestion, and a quantity of fluid is poured upon it in the stomach. I am convinced that a great number of people who suffer from restless nights and alarming dreams, may attribute it to drinking large quantities of this relaxing infusion before they go to bed. There is not the same objection to coffee, which may sometimes be of use; nor will one small cup of tea at night do harm, if habit has rendered it necessary, but it ought not to exceed this quantity.

Should an earlier hour than that I have named be chosen for dinner, then the "tea" becomes a more important meal, and a slice or two of bread and butter, with an egg, or some such addition, will be required. Indeed, to women

when suckling it is necessary that this kind of food should be eaten, in the interval between an early dinner and the breakfast of next morning, otherwise there would not be a sufficient supply of blood to the breasts, to insure the secretion of an ample quantity of milk.

Many are in the habit of taking a large basin of gruel the last thing before going to bed, and this unwholesome mess they are recommended to swallow, in order to promote the secretion of milk ; but it is as ineffectual for this purpose, as it is injurious to their general health.

Of all indigestible things, gruel is the most so. It creates acidity, and lies in the stomach until it ferments, and then causes all the spasm, heart-burn, and restlessness, that are so repeatedly the subjects of complaint with women who declare, and believe, that they have taken nothing but the most wholesome diet.

The stomach is distended and weakened by the gruel ; its power to digest the dinner previously swallowed is destroyed, and not only is it incapable of supplying nourishment itself, but it absolutely prevents the wholesome food, that would have done so, from being digested.

When, in consequence of this mischievous practice, the milk begins to fail, far from suspecting the real cause, more gruel is administered.

till at last the digestion is seriously impaired, the woman becomes materially weakened, her child emaciated, and the milk altogether ceases.

Let nothing, then, of this kind be taken at night, but let a rusk or biseuit be placed by the bedside, and eaten towards morning, when a sensation of "sinking" or exhaustion has been produced by nursing, and when the feeling of hunger interferes with sleep.

Such is the kind of regimen that women should follow, and it is as nearly as possible their diet under ordinary circumstances. If wholesome food is chosen, and eaten in moderation, neither mother nor child will suffer from adhering to the customary rules of living.

There never will be occasion to "force the appetite," but care should be taken to promote it by healthy means—such as early rising, proper exertion either on horseback or on foot; by avoiding long abstinence, as well as too frequent feeding: with these precautions, and a good constitution, there is seldom any reason why women should not be capable of suckling their own children.

The following classification of the different kinds of food will be found in Dr. Paris's "*Treatise on Diet.*"

"1. Fibrinous aliments, comprehending the

flesh and blood of various animals, especially such as have arrived at puberty.—Venison, beef, mutton, hare.

“ 2. Albuminous.—Eggs; certain animal matters.

“ 3. Gelatinous aliments.—The flesh of young animals—veal, chickens; calves’ feet, certain fishes.

“ 4. Fatty and oily aliments.—Animal fats, oils, cocoa, &c.; ducks, pork, geese, eels, &c.

“ 5. Caseous aliments.—The different kinds of milk, cheese, &c.

“ 6. Farinaeous aliments.—Wheat, barley, oats, rice, potato, sago, arrow-root, &c.

“ 7. Mucilaginous aliments.—Carrots, turnips, asparagus, cabbage, &c.

“ 8. Sweet aliments.—The different kinds of sugar, figs, &c.; carrots.

“ 9. Acidulous aliments. — Oranges, apples, acescent fruits.

“ Condiments consist of salt, vinegar, pepper, and the like.

“ Our drinks consist—

“ 1. Of water.

“ 2. Of vegetable infusions.

“ 3. Of fermented liquors—wine, beer, &c.

“ 4. Of ardent spirits.”

Three properties must be combined in food to

render it wholesome, and adequate to maintain the vigour of the stomach and of the entire system; these are—digestibleness, nutritiousness, and a certain power of exciting or stimulating digestion.

Occasionally the milk of the breast is of too rich a nature for the digestion of the child; it coagulates firmly, and the stomach not being able to digest it throws it off, or the curds passing into the intestines cause irritation.

At other times the milk is too poor, and the child ceases to thrive upon it.

In the first case, saline purgatives should be given to the mother, and her diet lowered and beer decreased in quantity, or totally left off. Often, when these precautions are taken, the symptoms from which the child suffers disappear: but there is a species of diarrhœa which sometimes is difficult to cure; it consists in the forcible expulsion of the whey-part of the milk twenty, thirty, or forty times in the day, the curd separately being evacuated totally undigested.

For this complaint, after the free effect of a dose of oil has been obtained, to remove the offending matter from the intestines, astringents, with aromatics, are of much service; and in all cases of diarrhœa, occurring in infancy.

the pomegranate bark is most useful ; and it is a medicine which will act beneficially in almost all cases of this disease, however severe they may be. From three to four grains may be given to an infant, combined with aromatics and chalk, and repeated every three or four hours.

When the milk is too weak, and evidently does not nourish the child, the mother must be strengthened and supported. Good diet should be enjoined, tonic medicines may be given, and the beer increased in quantity. Should these means, however, fail to effect the object, another nurse must be sought, and the mother's attempt to suckle relinquished.

In some instances, the menstrual discharge appears during lactation, and causes the milk to be less in quantity, or to become altered in quality. This may last for a few days only during the monthly discharge, the healthy state being restored afterwards, and then the child is again as well nourished as it was before ; but this is not always the case, and suckling is obliged, in some instances, to be given up.

The simultaneous occurrence of the menstrual secretion with that of milk is unnatural and unusual ; it seems to indicate that the uterus is

again in a fit state for conception, and it frequently happens that women, even while still suckling, become pregnant directly after the first appearance of the menstrual discharge.

CHAPTER IX.

WEANING AND TEETHING.

THE very erroneous notion, that weaning should take place at one fixed age, has been productive of many evil consequences.

The time for weaning must be determined entirely by the circumstances attending each separate case, and the appearance of the teeth is the guide to be depended on.

It is well known that during the time of suckling, the child is more free from disease than at any subsequent period of its life, provided the milk which it lives upon is healthy, and such as can be readily digested. If, therefore, the presence of disease in other children in the same family, occurring after they had been early weaned, or deaths from sudden attacks of convulsions or other circumstances, suggest the propriety of continuing, in future cases, the nourishment from the breast, the appearance of teeth.

even if they are all developed, need not be any hindrance; but care must be taken that no injury is done to the nurse's nipple during the process of suckling.

Instances of the benefit derived from prolonged suckling are continually coming under my notice, and in all that I have witnessed, without exception, it has proved most successful.

After a certain time, however, the supply of milk often begins to fail; and where this is the case, or if the mother, with a good supply of milk, becomes emaciated, for her sake the child ought to be weaned.

In former times it was the custom to wean suddenly, in consequence of which much trouble was experienced in giving the child artificial food, and in getting rid of the accumulated milk in the breasts.

The plan now generally adopted is not only in accordance with the dictates of nature, but it renders the process much easier, and leaves no fear of disease or discomfort arising from it.

It is now performed gradually, and should the child be prepared for a change of food, and is in a good state of health, it may be weaned between the eighth and tenth months, provided its teeth are in such a condition, as to warrant its being deprived of its natural

food ; but on no account, except under this last provision, should children be taken from the breast.

“In no apparatus put together by art,” says Paley, “do I know such multifarious uses so aptly contrived as in the natural organisation of the human mouth. In this small cavity we have teeth of different shapes, first for cutting, secondly for grinding ; muscles most artificially disposed for carrying on the compound motion of the lower jaw, half lateral and half vertical, by which the mill is worked ; fountains of saliva springing up in different parts of the cavity for the moistening of the food, while the mastication is going on ; glands to feed the fountains ; a muscular construction of a very peculiar kind, in the back part of the cavity, for the guiding of the prepared aliment into its passage towards the stomach, and in many cases for carrying it along that passage. In the meantime, and within the same cavity, is going on another business, altogether different from what is here described, that of inspiration and of speech. In addition, therefore, to all that has been mentioned, we have a passage opened from this cavity to the lungs, for the admission of air, exclusively of every other substance ; we have muscles, some in the larynx, and without number in the tongue, for the purpose of modulating that

air in its passage with a variety, a compass, and a precision, of which no other musical instrument is capable; and lastly, we have a specific contrivance for dividing the pneumatic part from the mechanical, and for preventing one set of actions interfering with another. The mouth, with all these intentions to serve, is a single cavity; is one machine, with its parts neither crowded nor confined, and each unembarrassed by the rest."

During the first months of infant life, the whole of the apparatus intended for converting food into blood is in a soft, and as it were inert condition. The lips, the tongue, and the cheeks, are required for the purpose of suction, and as the power they have to exert is comparatively small, their development at early periods is not very great; but as the infant advances in growth, the mouth becomes larger, the muscles become stronger, the jaws expand and lengthen, and preparations are evidently commencing, to receive the power to masticate and to digest food of a stronger consistence than the milk of the mother; and taught by instinct to encourage the development of the power of mastication, the infant constantly carries things to its mouth, which it bites, and thus prepares the muscles beforehand for the actions they will hereafter have to perform.

Here is another instance of the power of muscles being brought out by use, which, while dormant, were comparatively powerless. And again, should not an opportunity be afforded them to exert their power upon solid food, they would once more become enfeebled; that diet that had heretofore caused nourishment would now cease to do so, and emaciation would be the result.

It is highly necessary to watch minutely the effect of change of food on children, and to mark the alterations it causes in their systems.

Dr. Playfair* says, "the ordinary state of health in an adult animal consists in keeping the supply equal to the waste of the tissues of the body; when the supply is either greater or less than the waste, it is certain that the nutrition of the animal is effected under unnatural conditions."

The same thing occurs in the infant; and should there be more absorption than deposit of the tissues, the necessity for alteration of food is manifest; or, should there be an undue formation of the fluids or solids of the body, again is there reason for changing the diet.

I am induced here again to impress upon those who have the care of children, that emaciation in the adult may arise from exactly the opposite

* Lecture delivered to the Royal Agricultural Society, on the Principles of Nutrition, and on the Food of Cattle, December 1842.

cause that produces it in the infant; in the former it is usually the result of want of food in proper quantity, or, that contains more nutritious power; in the latter, it almost invariably is caused by over nutritious diet.

TEETHING.

At about the end of six months, or sometimes much later, for the time varies according to the strength and health of the child, the first teeth come through the gums; and about this time begin all those symptoms, some of them denoting extreme danger, and others of much more trifling character, to which children are liable, until they have completed the number of twenty teeth.

Teething is a natural process; and when nature is obeyed in all her laws, as regards feeding, it is but seldom that any untoward event accompanies the operation; but when no regard is paid to common sense in the feeding of a child, it is to be expected that bad results of some kind or other will follow.

“As a general rule, the organization will be found at every period of life to be exactly adapted to the wants of the individual. To the infant at the breast, for example, teeth are denied, simply because they would not be only useless, but an incumbrance, and would interfere with its sucking;

at a later period, however, when the natural food of the infant is no longer fluid, but firm and consistent, teeth are given, because without their aid such food could not be broken down or formed into a soft mass with the saliva to fit it for being easily swallowed and digested. In accordance with the same principle, when from weakness of constitution, or the effect of disease, the development of the system goes on with unusual slowness, and solid food is not so soon required, the appearance of the teeth is also delayed; thus affording another proof that weaning, and the change of food connected with it, ought to be regulated by the progress of organisation, and not merely by the number of months which have elapsed since the child was born.”*

The first, or milk teeth, are twenty in number, and consist of four upper and four under incisors; two upper and two lower canine teeth, and eight grinding teeth, equally divided between the upper and under jaw.

The first teeth that appear are the two lower centre incisors, then follow two upper centre incisors, and in stating that the next two teeth that are cut belong to the upper jaw, I am at variance with almost all authors who have written upon the

* Dr. Combe.

subject, but in nine out of every ten cases the fifth and sixth teeth are two lateral incisors of the upper jaw.

About a month or six weeks generally intervenes between each couple of these teeth. After an interval of two months, (it may be earlier or later in some cases) four of the anterior molar teeth appear; sometimes the first one comes through in the upper jaw, sometimes in the lower; and again, after a longer interval, generally at about the fifteenth or sixteenth month, the cuspidati or canine teeth are seen pointing through the gum, which are also the "eye teeth."

At about the twentieth month, or from that to the twenty-fourth, the number of twenty is completed by the cutting of the four posterior molar teeth.

The full number of adult teeth is from twenty-eight to thirty-two.

Particular attention is required at certain periods of teething; first, when six teeth have appeared; and again, when the canine teeth come through the gum.

At the time of the first, the child is usually weaned; at the second, a change of food is required; and if mothers would be entirely guided by the appearance or the non-appearance of the different sets of teeth in their mode of feeding chil-

dren, one of the greatest occasions of illness would be avoided.

They are too often governed by the advice of women, who having borne a large family, are supposed, on that account, to be skilful in the management of children ; and experience so acquired is no doubt valuable, when confined within its proper limits ; but if carried beyond these it may become actively mischievous.

Experience may enable a mother to employ rightly the ordinary domestic remedies, such as the warm bath, or a common aperient, where the state of the infant evidently requires such treatment, and to distinguish between the ordinary habits of a child, and those which result from disease ; but when it leads them farther, to pretend to an insight into the nature of diseases, and to employ powerful medicines for their cure—when they become adepts in the use of a number of quack remedies, or urge the exhibition of numberless indigestible artificial foods, in preference to those recommended by medical authority—then is experience not only carried beyond its proper sphere, but often misleads into dangerous and fatal errors.

We admit that the mother of a large family must have acquired much information, which will be useful afterwards to those younger than her-

self, but then her knowledge is generally of older customs : nor can she be expected to keep pace with the improvements, to which a closer attention and more intricate investigation of these subjects continually give rise.

It was at one time the custom to swathe a child at its birth, from head to foot, in bandages, and to keep it in this state for a long time ; and the result of this was local and constitutional debility, curvatures of the spine, ill-formed limbs, and attenuated muscles, because no exercise was allowed to the parts thus encased ; and the general rule, that to rest any part weakens it, was fully demonstrated.

Now, the more sensible practice is to allow freedom for the action of all the muscles ; the limbs are free to move, and the body to bend ; the very exertion they make reacts upon the muscles, and gives them additional strength ; and in consequence we are now seldom shocked by the appearance of those dreadfully deformed objects, who in former times were to be seen in almost every house in England.

The proof that these alterations in the treatment of children are real improvements, is found in the fact, that the mortality amongst them has so much decreased ; nor could any other than these beneficial results be looked for, when, as in

the present day, both medical art and domestic care are directed to one common object, namely, the keeping children, from the moment of their birth, as nearly as possible to a state of nature ; or to the recalling them to that state when any deviation from it has been made. In the present day no honest and educated practitioner pretends to effect magical cures, or to possess wonderful remedies, sufficient of themselves to eradicate every disease ; no medicine, it is admitted, will answer the purpose, unless assisted in its action by attention to diet, and to other circumstances, all tending to aid and encourage, rather than to force a return to a natural and therefore healthy state.

In the regard which is now paid to the simple dictates of nature in the method of feeding children, the practice of the present day is completely at variance with the foolish and superstitious customs which formerly prevailed.

In order to avoid these mistaken practices, and in the hope of eradicating by degrees such erroneous notions, I always recommend parents to procure comparatively young attendants for their children, who are rather willing to be corrected ; than to insist on acting according to their own prejudices.

The period for weaning then, I repeat, is to

be regulated by the appearance of teeth, and till these are supplied, the child must continue to be fed from the breast; and if the mother is unable to afford sufficient nourishment, another nurse must be provided.

Where the necessary expense attending the hire of a wet-nurse is a consideration, diluted cow's milk may be substituted, under the rules here laid down for its use; and although it cannot be said that children thrive upon this quite as well as upon breast-milk, yet it is the best substitute, when other more costly kinds of diet cannot be procured.

As the infant has no other means of conveying food into the alimentary canal, besides the power of suction, so the feeble stomach is capable of digesting only liquid food, and that of the lightest kind.

If, at a certain fixed period, without waiting for increased power of digestion, such as the presence of teeth indicates, mammiferous animals were to be thrown off from the support of their mother, they would inevitably starve; the foal of a mare, without the incisor teeth, would have no means of procuring grass for itself; nor could animals of the carnivorous kind masticate their food, till their grinding teeth were sufficiently developed, however great an age they might have

attained ; so that the very subsistence of these animals depends upon the continuance of a supply of milk from the mother, until the teeth have so far grown, as to enable them to provide and to masticate food of a different kind : and it is worthy of remark, as showing the advantage of imitating nature as far as possible, in our method of feeding children, that there is seldom any variation in the period of teething in graminivorous or carnivorous animals, which may be fairly attributed to the natural mode of living of the parent, and to the total absence of artificial interference, in the diet or management of the young.

The provisions of nature are in every respect consistent, and keep pace with the progress of the child.

As soon as it has acquired strength to digest more solid food, and the mother's supply fails, the teeth begin to be developed for the purpose ; and at a later period, when food is sought of a more fibrous character, and requiring more mastication, the first teeth are supplanted by a stronger set, and the general arrangements of the mouth are strengthened in proportion.

Sometimes when the mother is weak, and the milk unhealthy, weaning may be attempted when

the first eight teeth have appeared; but this should not be considered as a rule.

Many writers are of opinion that the presence of six teeth indicates a necessity for weaning, because it is in the power of the child to injure the nipple of the mother's breast; but animals in a state of nature continue to be supported by the mother's milk long after the incisor teeth are developed.

There can be no doubt as to the intentions of nature that the period of suckling should be continued longer than is commonly the practice; and we find that among savage nations the breast alone yields nourishment to the young until they have advanced to the end of their second year.

In this country, the time of weaning is generally about the eighth month; nor will any harm generally result from it, provided the food afterwards given is not at variance with that which has nourished the child up to this period.

The mode of weaning adopted by the lower animals is worthy of imitation, as exhibiting at once a simple process, and one attended with no difficulty or uneasiness either as regards the young animal or its mother; they allow their young to suck at gradually increasing intervals, till at last, when they are fully able to provide

food for themselves, they drive them entirely away.

Instead of giving the breast-milk exclusively up to a certain period, it is better to supply artificial food to the infant from a bottle alternately with the breast-milk for two or three days ; then to give the artificial food twice and the breast-milk once, that so by degrees it may become indifferent to the latter, and perhaps altogether careless about it ; thus, the milk not being called for, will gradually cease to be secreted ; the course of medicine, the prescribed regimen, the local applications, and all the modes formerly thought necessary for checking the secretion of milk, are in this way replaced by the simple exhibition of a saline purgative in the morning, after the entire cessation of suckling, and friction by the hand upon the hardened breast once or twice during the twenty-four hours.

All who have hitherto written, either upon diseases incidental to children, or upon hereditary diseases connected with the chest, recommend that sickly children, or those of unhealthy parents, should be suckled for a longer time than usual by the breast alone, because they will always be found to thrive better upon it, and become so habitually robust, as to resist the hereditary tendency to disease and debility.

But at the same time, the same authors will recommend lists of different kinds of food so completely at variance with human milk that it cannot be for a moment believed the weak action of a child's stomach can possibly digest them. They are, indeed, satisfied that human milk is easier digested than any other food; they are convinced that it gives better nourishment than any other; and yet, when a child is to be deprived of it, they seem to take leave of common sense, and prescribe an indigestible diet, so little resembling human milk, and so different in its properties from the child's natural food, as to require powers of digestion possessed only by animals of a distinct nature to convert it into chyme.

CHAPTER X.

FEEDING.

At the time of weaning, the artificial food should always be given by means of a sucking-bottle. The mouth of it should be covered with a piece of wash-leather or parchment, doubled, and sewn like the finger of a glove. Sometimes a piece of sponge is placed within the mouth-piece, but it is not at all necessary.

The teats of the heifer are sold for the purpose of covering the mouth of the bottle, but the plan is an unpleasant one, both as regards the process of sucking, and the necessity of preserving them from putrefaction; by keeping them in spirit. The prejudice in their favour is simply derived from the fact that they are formed by nature; but it should be remembered, that in their natural condition they are attached to the mammae, and the openings in them connected with the milk tubes; when separated from these, they are simply portions of perforated integu-

ment, not at all preferable in cleanliness or convenience to those mouth-pieces made of parchment or leather.

None of the artificial mouth-pieces made of hard substances, such as ivory, metal, and wood, will be found to answer the purpose. It is contrary to nature for the child's gums constantly to be biting hardened substances, and I have no doubt of its being detrimental to the early development of the teeth, from its hardening the gum, and making it less easy for the teeth to penetrate.

Indian rubber mouth-pieces do not answer any better, though they tend perhaps to promote the growth of teeth; and rings made of this substance for the amusement of children are very useful for the purpose, and are much to be preferred to those made of ivory or other hard materials.

The object of using the bottle is, that the child shall take only so much as it requires, and must use exertion to procure.

If it is fed with a spoon, it will get more than the stomach can digest; if it works for its food, it will only take enough. Besides, in feeding it by means of suction, its natural mode of living is as far as possible imitated.

It is especially necessary that every vessel or

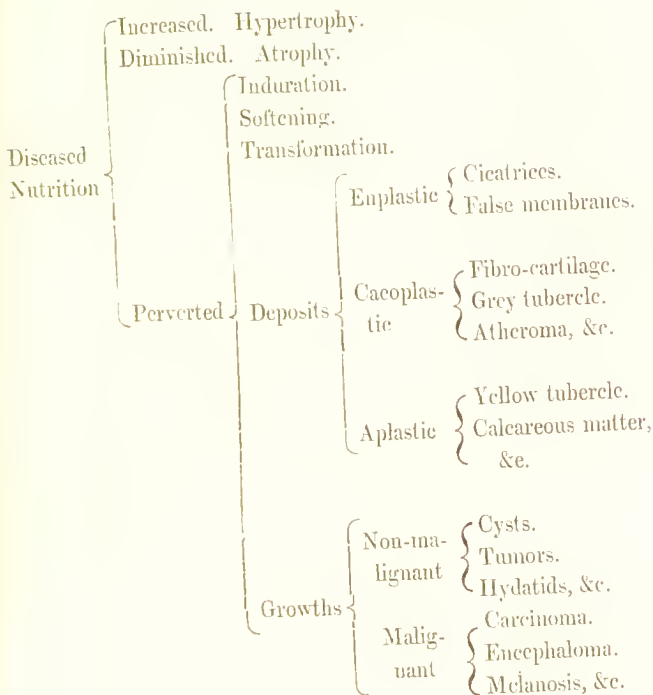
spoon which is used in making the food, or in giving it to the child, should be free from acidity, and be clean. It often happens, when care has not been used, that some milk, or other food, adheres to the edge of the vessel ; it becomes acid, and impregnates the succeeding meals, and has a bad effect upon the child. The best way to prevent this is to scald, after every meal, the vessels used in preparing it ; and no pains should be considered too great to prevent the least particle of acidity in the food.

Dr. Williams has arranged unhealthy nutrition under three heads—increased, diminished, and perverted nutrition ; and he has planned the following table, by which the effect of each form of unhealthy nutrition may be readily seen as regards structural lesions.—(*See next page.*)

It is scarcely necessary, after referring to this table, to insist more strongly upon the strictest attention to diet in infancy. This exposition of the multitude of elementary diseases to which the human frame is liable, is sufficient to deter parents from falling into errors in either extreme ; for it is not merely theoretical, the truth of it is daily experienced in practice.

Thus, when toothless children are fed upon strongly nutritious and concentrated food of any kind, hypertrophy is produced ; and though,

ELEMENTS OF STRUCTURAL DISEASE.



while the state of the textures is not as yet that of full health, there may be a deposit of fat, and an appearance of general vigour, and no derangement of the digestive organs, yet no sooner is a state of full health attained, than plethoric symptoms supervene, and inflammation of some organ ensues.

Thus we are often deluded for a time by the apparently good effect of strong nutritious food, and then discover the ill consequences when it is

too late for advice or persuasion to be of any use.

Atrophy, the effect of improper feeding, is of very common occurrence, and is the consequence of an absorption of the textures, which is going on to an extent much greater than the supply to them by nutrition.

It may arise from some other causes, but principally it is the effect of improper feeding, rather than the absence of a sufficient supply of food.

Thus, if food of too powerful a nature for the digestive organs to convert into chyme is given to a child, it lies in the stomach undigested, and is at length either rejected or carried through the intestines in its crude state, acts as an irritant to the system, and is a direct cause of emaciation.

Of perverted nutrition we have examples in glandular swellings, deposits of all kinds, or ulcerations, &c.

Any variation from the standard of health in children may almost invariably be attributed to derangement in the alimentary canal, and in nearly all instances will indicate a necessity for altering the quantity or the nature of the food.

“ In health, the digestion of food is easy and without annoyance. But when, after food is taken, there is pain, sickness, eructation, flatulence, or the like, we know that the function of digestion is changed from the healthy standard,

and is diseased.”* In noticing the different means by which it is generally recommended that children should be reared, it is as well to state at once, how improper are the vegetable foods in ordinary use, when given to an infant of a very early age.

Sir Walter Scott thus describes the effect of a “severe vegetable diet” upon himself: he says—“I was affected, while under its influence, with a nervousness which I never felt before nor since; a disposition to start upon slight alarms; a want of decision in feeling and acting, which has not usually been my failing: an acute sensibility to trifling inconveniences, and an unnecessary apprehension of contingent misfortunes, rise to my memory as connected with vegetable diet.”

If such effects as these were the result of vegetable diet in an adult man, whose natural food should be derived equally from the vegetable as from the animal kingdom, how much more deleteriously must it affect the infant, whose sole nourishment should consist of purely animal material!

Most writers advocate some particular food, on which they insist as the only kind proper for the nourishment of children; but, although in scientific improvements medicine has perhaps gone as far as other arts, it nevertheless is in a stationary position regarding the diet of infants.

* Williams’s “Principles of Medicine.”

Their prescriptions are drawn both from the vegetable and the animal kingdom: but when it is recollected that the infant, if allowed to be nourished by its mother, lives entirely on animal food, it is not very probable that a successful result can follow the adoption of a vegetable diet. It is as absurd, in fact, as the attempt to exchange the substances on which graminivorous and carnivorous animals respectively feed.

Animal food, then, ought to be the sole diet of infants who are weaned at an early age, and in order to imitate as nearly as possible their natural food; asses' or cows' milk should be the sole nourishment.

Dr. Thomson, of Glasgow, in a paper in the Med. Chir. Trans. formed a table of much value, which shows how well milk is adapted for a growing animal, as containing less colorifying power than any of the ordinary vegetable productions, usually employed as food, and therefore as being less likely to create fever and to increase that tendency to inflammatory diseases which belong to childhood:—

APPROXIMATE RELATION OF NUTRITIVE TO CALORIFIANT
MATTER.

Milk	1 to 2
Beans	1 to 2½
Peas }	1 to 3
Linseed }	
Scotch oatmeal	1 to 5

Wheat flour	}	food for animals at rest.	{	From
Maize				1 to 7
Barley				to
				1 to 8
Potatoes				1 to 9
East Indian rice				1 to 10
Dry Swedish turnips				1 to 11
Arrow root	}			
Tapioca				1 to 26
Sago				
Wheat starch				1 to 40

The different chemical proportions of the milk from different animals have already been noticed, and it was shown, that of all milks, that of the ass or of the mare was the best adapted as a substitute for human milk.

It has been already stated, that the quality of human milk which renders it so wholesome a food is the diluted state in which it is secreted; therefore, in feeding children artificially, this should be the principal object of consideration. And on this account the milk of the ass, as a substitute, should be preferred to any other kind of food, if circumstances will admit of its use.

For the reasons already mentioned, the milk of the mare, the goat, and the sheep, cannot in this country be employed; but cow's milk is universally used, not only in infancy, but in all ages.

Now, cow's milk, from a healthy country-fed cow, and unadulterated, contains a large quantity of casein; and on this account, even by adults, is found to produce sickness and headache; therefore, it should not be given in its pure state to infants.

Human milk possesses only a little more than half the casein that is contained in cow's milk; it is necessary, then, to dilute the latter in proportion, so that it may be brought into an equal condition with human milk; but the quantity of water added must depend upon the strength and age of the child, and should it be necessary to give an occasional artificial meal, during the earliest weeks of life, equal parts of milk and water will be the proper proportions.

Should fever occur, and strongly-formed curds ever be vomited, or passed undigested from the bowels, the milk must be still more diluted; it will thus be reduced in strength sufficiently to correspond with the weak powers of digestion, and will be suited to give nourishment to the system.

Albuminous food is easy of digestion just in proportion to its mechanical condition; thus egg, which is nearly pure albumen, if taken into the stomach, either very lightly or not at all coagulated, is perhaps as rapidly chymified as any ar-

icle we use as food. If previously formed into hard coagula by heat or otherwise, and swallowed in large solid pieces, it undergoes a very protracted digestion. The reason is intelligible enough. In the first case, the albumen coagulates in the stomach in a light filmy, porous, semi-transparent, watery substance, having been penetrated or infiltrated with the gastric juice. In the second case, the gastric juice has to operate, not on the whole at once, but upon layer after layer of its surface.

It has been stated that other kinds of milk, when acted upon by the stomach, are immediately coagulated, and then converted into chyme; but that human milk is so lightly coagulated as to become simply a fine filmy substance, and that no strong curds are ever formed in the infant's stomach from the milk of the human breast.

Analysis has proved that the peculiar formation of coagula of human milk is assisted by an alkaline property, which not only affects it in this manner in the stomach, but also prevents it from forming so strong a cream when kept for any time in the air, as the milk of the cow would do.

In order to imitate this alkaline property, when curds form in the stomach from cow's milk, a little lime water may be added, and much benefit will be derived from it. A table-

spoonful may be mixed with each half-pint of the diluted milk.

It is not necessary for the milk to be boiled, unless it has been procured from the cow at night for the morning's use; then it will be preserved in a more mixed state as regards its chemical properties, which do not separate so quickly as when the milk is unboiled.

Human milk contains a little more sugar than cow's milk, but the excess is so small as not to require the artificial addition of sugar for the sake of its nutritious qualities; yet it is often advisable to please the taste of a child by adding a little powdered sugar.

An exact imitation of human milk is, indeed, impossible. No chemical combination has ever been formed to equal it, either in its digestible or nutritious properties; but, by the above-mentioned mode of treating cow's milk, so close a resemblance may be attained as to answer every purpose in the greater number of cases.

In London, I believe, cow's milk is invariably sold in a diluted condition, and the greater part of it is obtained from cows which, for a year together, never see daylight, but are pent up in stables, or rather cellars, often under ground, and during the greater part of the year are fed upon coarse dry food. In London, therefore,

two things are to be borne in mind—the one is, that the milk has been already diluted; and, secondly, that, when taken from the cow, it is in a weaker state than it would be if the animal had been more healthily fed.

The custom of thickening milk with a variety of vegetable preparations, in order to make it more nutritious, is generally most pernicious.

Breast milk is fluid, and of limpid consistence; and yet most writers are found to recommend the avoidance of this property in their imitations of it, by the addition of a thickening mixture; but it need hardly be repeated, that the vegetable addition would be followed by all the usual symptoms attending indigestion; and every experienced person will be aware of the tendency of thick food, of any kind, to produce dyspepsia in its most complicated forms.

At a very early age, milk is never too limpid, and is rarely so for those more advanced in life; but it does *sometimes* happen that, owing to its lightly fluid state, it is not retained in the stomach and duodenum of older children, long enough to be absorbed by the lacteals; under such circumstances it does not afford sufficient nourishment, and requires some addition to render it more consistent, in order that it may be

retained long enough for the action of the stomach to be properly exercised upon it.

The quantity to be taken varies in proportion to the strength of the child.

A newly-born infant takes at once from two to three ounces of milk ; its digestion is quick, and in two or three hours it requires another meal ; and this frequency of feeding is continued both day and night. If sleep, however, is prolonged for a time, it is well not to disturb the child ; but, while some children require food every two hours, others will remain from four to five without it.

A great deal may be done by management, and habits may be induced by bad nursing which otherwise might have been prevented.

After the first month or six weeks, a child should be suckled about five times in the day, and twice in the night.

When a little older, it may be made to suckle late at night and early in the morning, and three times a day besides ; more frequent feeding than this, for a child three months old, is not required.

It is too much the custom of some women to make themselves slaves to their children, to avoid society and their ordinary amusements, for the sake of nursing ; and their example frequently deters others, who are unwilling to submit to such rigid

confinement, from undertaking what appears to them a most irksome task.

It is by no means my intention to exonerate such people from blame. No doubt it is their duty to pay proper attention to their offspring, in disregard of any inconveniences that may arise ; still I cannot help remarking, that there is no real cause for such excessive devotion. A child will not starve because the mother leaves it half an hour longer than usual without its food, nor even if any affair of importance should oblige her to omit altogether one of the regular periods of feeding, provided the child is supplied with *proper* artificial food ; nor, if there is a reasonable cause, will any bad result follow from the regular substitution of this kind of food, once or twice in the twenty-four hours.

From a prejudice that it is wrong to administer two kinds of milk, nurses would rather give any deleterious food to sickly children than either cows' or asses' milk : it is necessary to be prepared to meet absurdities of this nature, and to resist them.

When children are weaned at about eight or ten months old, they require to be fed about four times in the day, and under good nurses they will not require food in the night, after a month has elapsed from the time of weaning ; but with

some children, whose constitutions are weak, and whose circulation is languid, an extra meal in the night becomes sometimes necessary.

The quantity for each meal varies from a pint to half that quantity, but the extent of liquid food may be regulated by the desires of the child, provided it is of such a character as to suit its powers of digestion ; for from the breast it would withdraw such a quantity of milk as would satisfy its hunger without any limit whatever.

The other animal foods that are recommended, and, it is to be regretted, much used, are broths, chicken or beef tea, panada, &c.

I do not hesitate to say, that any one of them, if given to a child while teething, will be destructive to its health within a few days, and perhaps will already have laid the foundation for disease, the result of which may very probably prove fatal.

Various symptoms, all serious in their character, will ensue ; the child will become emaciated, its joints enlarged ; it will have glandular swellings, together with constant vomiting or purging ; it may become languid and cold, or, if by chance it digests the food, it will be suddenly attacked by fever, sometimes attended by local inflammation.

These results will commonly follow the mode of feeding above mentioned, but to those who are

much accustomed to the complaints of children it is needless to mention the multitude of illnesses that are entirely caused by such improper diet.

It is the usual custom, if a child does not thrive upon diluted milk, to change what is already too powerful a food to one still more so, and disease invariably supervenes; instead of this, if the milk had been further diluted, the cause of the complaint would probably have been at once removed. We are often called upon to witness diseases which (to the inexperienced) appear quite unconnected with the organs of digestion, and yet arise entirely from the derangement of these functions; a derangement which is hourly increased by such improper diet as cannot add one particle of strength to the debilitated child. Such diseases, however, are found to yield immediately under a lighter diet, without even the assistance of medicinal remedies.

It is certain that, in nine out of ten children, that food which contains less nutritive matter is most calculated to impart strength; whereas that which is most nutritious in itself, is, at the same time, most weakening to the child.

The results that invariably follow the plan of feeding here recommended will, of themselves, prove its efficacy; but an instance of the good effect of diluted diet upon children occurred to

me in the ease of a child who had been weaned, and by my desire was fed on diluted milk. I accidentally once witnessed the feeding of the child, and noticing the extreme transparency of the food, I inquired its strength, and was told that it was made of three parts water and one of milk. The quantities, by mistake, had been reversed ; my directions having been, three parts of milk and one of water. The milk was procured in London, and was probably, therefore, already diluted ; and yet this child, although having been fed upon it for some weeks, was at that time healthy and robust, and is now one of the most flourishing children any where to be found.

I was lately told by a lady, for whose children I had prescribed, that when they were ill before they had got their teeth, she lessened the strength of their diluted milk ; if they still were unwell, she added more water, and again still more until the symptoms of sickness ceased, which they invariably were found to do. She then kept the food at the reduced consistence, and no return of illness occurred.

It is generally supposed that broths and soups are highly nutritious, but unless mixed with solid matter they are quite the contrary.

“ When the stomach has to operate on soup

alone, it appears embarrassed between the direct absorption of the liquid part and the difficulty of acting upon the aliment so much diluted.

“Digestion is slow, the superfluous liquid is tardily absorbed, and then only the rest is chymified.”*

It is needless to say, that panada, which consists of meat beaten in a mortar until its fibres are destroyed, and it becomes a semifluid mass, in which is often mixed milk or cream and spices, is totally unfit for an infant's stomach. It is, in fact, meat ; and a toothless child will not be more able to digest this mixture than solid meat ; for, as has been before observed, where there are no teeth in the mouth, the power of the stomach is only capable of chymifying liquid food.

Jellies, isinglass dissolved in liquids, and other such preparations, may all be classed under the same head of indigestibles, and may be put aside as totally unfit for children's food.

The deaths that occur in consequence of feeding with solid meat can scarcely be esteemed the result of ignorance in parents, or others who have the charge of children. There may be some palliation for the error of giving *liquid* food too stimulating for the digestion ; but it is something

* Mayo.

more than ignorance, when a tender infant is gorged with strong and heavy substances, suited to the digestion of a full-grown man.

Farinaceous foods are most frequently given to children, and with nearly the same bad results.

It is true, that chyme formed by vegetable matter has been found by analysis to be composed of the same chemical ingredients as that formed from animal food ; but the means provided in infancy to act upon food to produce chymification, are adapted to animal and not vegetable matter. Under these circumstances, food of the latter kind is obviously improper.

Animals whose proper food is flesh will not thrive if fed upon vegetables: thus, a dog fed constantly on meal or biscuit will become diseased and mangy, or it grows thin, and the food passes through it undigested.

The same thing often happens to infants ; oat-meal and biscuit-powder not at all unfrequently may be seen undigested in the evacuations, as may all kinds of the usual vegetable food.

It is useless to say that one preparation is preferable to another, for they are all equally bad ; and, until a child has many teeth, it will be highly improper for any one of them to form its food.

Many children, it is true, contrive to struggle

through the mismanagement of their early years, under all the disadvantages of improper diet, and amidst many needless pains and sufferings occasioned by it; but so miserable, from the same cause, is their future career, that it would almost have been better for them not to have survived the perils of infancy.

These considerations ought to put parents upon their guard against any attempted violations of the rules which nature evidently prescribes; should induce them to be cautious in tampering with the health and happiness of their children, by neglecting the wise order appointed by Supreme wisdom; and should warn them against the dangerous practice of setting aside the admirable provision already made by Him for the wants of infancy, in favour of artificial, and therefore imperfect, if not absolutely injurious substitutes.

In recapitulation of the rules which have been here introduced at length, I would again observe, that at the ordinary time of weaning, after the child has ceased to receive food from the breast, it should be fed entirely on asses' milk, or on cows' milk and water; no thickening is necessary; and as any additions whatever are for the most part dangerous, they should never be made except under medical advice.

This food will be proper till the age of twelve

or fifteen months, or even two years, if necessary ; and from the many opportunities I have of comparing the condition of milk-fed children with that of others who have been sustained with broths and vegetable diet, I can safely assert that it will be a means of preserving the child from many serious complaints, and will conduce to the healthy development of every organ and function of the body.

Without taking into account the age which the child may have attained, as long as teeth are wanting this kind of diet ought to be persisted in ; unless, indeed, some very peculiar circumstances, such as are not likely to occur in healthy children, require a change : whether such an alteration is really necessary, medical experience alone is competent to judge.

When a child has fairly cut eight incisors and four double teeth, it evidently has acquired a power of bruising food of greater substance ; we presume, therefore, that the stomach also is now capable of digesting it ; still, in the absence of the canine teeth, meat would be almost as improper as before, for in carnivorous animals in a wild state, the canine teeth are requisite to seize and tear the flesh, before the grinders can be employed in bruising it ; accordingly, till these are developed, they continue dependent upon

their mother. Hence we conclude that strong fibrous food should not be given till after the appearance of the canine teeth.

Nor, indeed, should any change be made during the time of cutting teeth; for then the liability to disorder, and the excitement of system that prevail, require an abstinence from anything that is likely to increase the irritation. But when the double teeth are completely through the gums, the pure milk diet may be partially discontinued, and an admixture of vegetable substance may be permitted.

The child is now progressing towards a maturer state, and should be gradually made acquainted with the various kinds of food which will serve for its subsistence throughout the rest of its life.

In the intermediate state, between the first indications of a change, which renders a pure milk diet no longer sufficient, and the more complete development of the system still to be expected, the vegetable preparation called "tops and bottoms" is the best artificial diet which the refinements of the age have invented; they consist of rolls of a peculiar size, divided in the centre, and then each part partially rebaked; it is important in making infants' food from them that they should be fresh and well preserved; and in both these respects Leman's are the best.

One method of preparing them for immediate use is simply to pour boiling water upon them ; and when completely saturated, to mix them together, and then add a little milk. This forms a highly nutritious and wholesome food, either with or without the milk, which may be added or not, according to the condition of the child.

Another method is, to boil for a few minutes a certain number of tops and bottoms, enough for the day, in water ; to mix them together, and then pour them into a basin, in which, when cold, they form a kind of jelly : from this may be taken at each meal enough to supply food for the time, and when required it may be mixed with boiling milk.

Generally speaking, from two to four of them will make a meal, and one such meal in a day will be enough at first ; the other meals being, as before, composed of milk and water : the number altogether should be about four in the twenty-four hours : none is really required in the night.

This mode of feeding should be continued, no matter how long, until the appearance of the four canine teeth : sometimes children dislike the taste of tops and bottoms, and then a cupful of bread, with boiled diluted milk, may be given, and generally one or other of these preparations will be

found to answer in every respect, and to produce the finest and most healthy children.

The bread used should always be two days old at least : new bread is often the cause of most alarming symptoms, and should be avoided.

As the child advances, two such meals may be taken daily, and less milk and water.

At length the “eye” or canine teeth appear, completing the number of sixteen, and indicating the propriety of a further alteration in the regimen.

The milk and water may now be entirely discontinued, or only taken as an ordinary drink ; the first meal of the day may consist of bread with diluted milk, or, instead of bread and milk, the “top and bottom” food may be given ; either will suit the digestion of a child who has sixteen teeth.

At about eleven o'clock, a rusk or a biscuit may be eaten, and for drink, some toast and water, or a little diluted milk.

At one o'clock, for the first month after all its teeth are through, it may have broth made of mutton, chicken, or beef, but this should not be taken in a fluid state, for in that condition it has already been stated to be very difficult of digestion ; rusks or toast should be soaked in it ; these absorb the broth, and produce nutritious food.

A breakfast eupful may be taken daily at dinner, and then at five or six o'clock some more food of " tops and bottoms," of bread and milk, or bread, toast, or rusks, eaten dry; and with them may be drunk some diluted milk.

The hour of rest should not be later than seven o'clock, and should anything further be required, a biscuit may be eaten at night.

It is very necessary that food should be given upon first waking; much harm is done, not only at the moment, but more permanently, by allowing an hour or an hour and a half to elapse during the time of the whole process of washing and dressing before partaking of food. The child becomes languid, owing to the number of hours it has been fasting since the last meal at night, and does not rally during the day; and when this is from day to day repeated, much permanent debility will result.

The next change in diet will be from liquid animal food to solid meat, when the canine teeth have appeared completely through the gums.

Meat should not be repeated every day at first; alternate days will be quite enough for three or four months; the intermediate days may be supplied with broth or beef-tea and toast, or with light puddings made of bread, of tapioca, or ground rice.

The meat should be finely divided into shreds, and mixed with bread-crums, and with it some toast and water may be drunk.

This diet may be continued for an indefinite period, and, should the child thrive well, no alteration should be made ; if otherwise, medical advice should be called in. It is impossible for inexperienced persons to be capable of deciding whether an increase or diminution of food is required, or whether stimulants are necessary.

In most instances, plain water or toast and water will be best for children's drink at dinner, but when the circulation is languid, it may be advisable to substitute a little malt liquor, or wine and water ; and at all events, sufficient food must be given, and the meals repeated often enough, to maintain a proper strength of circulation.

Under ordinary circumstances the meal at dinner is the last absolutely efficient one that is taken during the day, the food eaten at "tea-time" being small in quantity, and the meal itself usually an unimportant one ; but it must be recollected, that from that time to the breakfast of the next day is a great space of twelve or fourteen hours, and although sleep in a great degree renders food unnecessary at the time, yet

the interval is not unlikely to be followed by exhaustion.

Nurses, and others who dine at an early hour, make up for the deficiencies of tea by a hearty supper; but with children, who go to bed supperless, tea is an important meal; they should be urged to take sufficient at that time, and some of them require a rusk or biscuit before going to rest.

CHAPTER XI.

DOMESTIC MEDICINES.

IN treating of the infant's digestion, it is scarcely possible to omit all mention of those simple remedies, which may be used with much advantage in the ordinary symptoms of dyspepsia.

Although it is highly dangerous for nurses and other uneducated persons to administer remedies, when real illness occurs, yet a mother should always be prepared to apply those simple medicines, whose immediate effect in removing the consequences of an undigested meal, is well known.

Purgative medicines are mostly called for in slight complaints; and of these there are four kinds.

The warm stomachic, rhubarb, which acts upon the upper part of the alimentary canal, saline purgatives, which act principally upon the small intestines; and drastic purgatives, which cause action more especially of the larger or lower bowels; and the oily purgatives, which are in

many cases preferable, owing to their action being carried on entirely without irritation.

Rhubarb is the purgative generally in use, and when there is evident "acidity," it is of great service in freeing the stomach and duodenum of undigested food.

It may be given by itself in doses varying from two to eight grains, according to the age of the child; the former dose being proper for a young infant, the latter for a child of two years old.

To this may be added magnesia, or sulphate of potash; the latter should be given when the indigestion is accompanied by any degree of fever or excitement; the former, when food, upon being ejected from the stomach, is found to be particularly acid in its odour.

The dose of magnesia should be about three or four grains for an infant, and eight or ten for an older child; of sulphate of potash, five grains for an infant, and from a scruple to half a drachm for a child of a year and a half or two years old.

Children who are inclined to become heated from indigestion may often be kept free from it, by having every third or fourth night a few grains of rhubarb and sesquicarbonate of soda.

The saline purgatives consist of sulphate of potash, which has been noticed, of common Epsom salts, and of tartrate of soda and tartrate of potash.

These remedies are seldom required previous to the time of teething, but during that process they should be preferred to other kinds of purgatives, owing to the effect they have of lessening the quantity of fluids in the body, and so reducing the tendency to inflammation; but great care should be taken to avoid over-dosing under any circumstances, and with saline purgatives especially, for a dose of saline aperient medicine given to a sickly child, with but little power and less blood in its system (for whom rhubarb would be the proper remedy), might be of very serious consequence; this, therefore, is a cogent reason for the careful administration of none but the most simple medicines, even to robust children, without the sanction of competent medical authority.

A very good medicine, where a saline purgative is required, for a child from six months of age, is a portion of Seidlitz powder, beginning with a fourth part of the usual dose, and increasing it as the child advances in age, up to the second year.

Half a drachm of the tartrate of soda, or of potash, will be equal to a quarter part of the Seidlitz powder, and will answer the same purpose, the former being the purgative used in the Seidlitz powders.

The advantage of these over Epsom salts is,

that they are comparatively tasteless, and may be mixed with liquid of different kinds ordinarily taken as food, so that there need be none of the ill effects of the resistance, often made by badly trained children to a dose of medicine. The Seidlitz powders should have been made to effervesce by admixture in a small quantity of water, previously to their administration in the food.

To these saline remedies are often added manna, of which from half a draehm to one draehm should be given.

Sometimes both manna and saline purgatives are useful, when dissolved in infusion of senna, and a very effectual draught is made for a child of about a year old, when teething, by dissolving half a draehm of sulphate of potash, half a draehm of manna, and ten grains of extract of liquorice, in about five or six draehms of senna tea, to which may be added syrup of ginger, or tincture of cardamoms.

The liquorice will always be found an excellent addition to senna tea, as concealing more effectually than anything else the disagreeable flavour of this medicine.

A most excellent purgative for common use is "Freeman's syrup of senna;" from one to two teaspoonfuls given in the morning will be found to create no nausea in the child,

and to act certainly and beneficially upon the bowels.

The drastic purgatives commonly in use are jalap and scammony.

The former is beneficial when from any cause a quick and effectual evacuation from the bowels is required, but it is likely to create nausea and vomiting, and on this account is not ordinarily a very advantageous remedy. The dose is from two to six grains for children under two years of age.

Scammony is a highly important medicine for children; it has the effect of removing thread-worms from the intestines more completely than any purgatives; the best form of it is the "scammony with calomel" powder of the Pharmacopœia.

It consists of four grains of scammony, two grains of calomel, and two of sugar; the latter divides the particles of scammony which from their nature are inclined to adhere to each other.

These eight grains will be a sufficient dose for a child about a year old and upwards; it is generally necessary to repeat it once or twice before the intestine is completely relieved.

Oily purgatives are properly used for children when very young; half a teaspoonful of castor oil given to a newly-born child acts mildly upon the bowels, merely removing their contents without

creating pain or uneasiness of any kind, or producing subsequent irritation.

MERCURIAL MEDICINES.

It was formerly the custom, when an absolute effect of mercury upon the system was required, to administer it in such large doses that salivation to the greatest extent was produced ; the teeth were destroyed, portions of bone exfoliated, and often death was the result of the remedy rather than of the disease. But in the present day the desired effect is obtained in a way which inflicts no permanent injury either of a local or general character. It has been found, that if soreness of the mouth is produced, and kept up for a longer or shorter time, according to the circumstances of the case, the required alteration will be effected in the system, and the disease eradicated. Of course, I am here speaking of those chronic complaints in an adult for which a continuation of mercury is required, and not of those acute and sudden attacks, where the question is between the production of an immediate effect by means of mercury, and approaching death.

Here large quantities must be used in frequent doses, leading, no doubt, to much future suffering ; but such a course is only resorted to when it is a

matter of uncertainty which result will be first obtained—the triumph of acute disease, in the destruction of life ; or of mereury, in producing speedy salivation, and checking its progress. It is needless to point out, in such cases, the advantages of so powerful a remedy.

And as these effects, confessedly detrimental to the health, are not obtained except by the frequent repetition of large doses of strong mercurial preparations, such as the emergency of the case demands, there is no ground for apprehending any mischief from the occasional use of a single dose of mereury ; which would produce no permanent effect, either upon the mouth or on the constitution ; but acting simply upon the secretions in general, and especially upon the liver, could not be, under ordinary circumstances, at all detrimental.

That this valuable medicine, even in the present day, is shamefully abused and misapplied, I cannot deny ; but still, the prejudices which prevail against its legitimate use, in the hands of competent persons, are quite unfounded ; they are fostered, however, by the dishonest pretensions of quacks, who, under cover of a falsehood, whilst crying out against the use of calomel, themselves prescribe mereury in other preparations and forms. There are many amongst the illegal

practitioners in the metropolis, who are guilty of this gross dissimulation, and encourage popular prejudices, in order to win the public favour.

The absurdity and duplicity of these opinions and pretences will be apparent, when it is known that blue pill and grey powder, which are thus frequently prescribed where calomel is abjured, are equally preparations of mereury; they require merely to be given in larger doses than calomel, but the same symptoms may be produced by either of the three.

The custom of prescribing calomel indiscriminately for all diseases of children is now generally abandoned; no doubt much harm is done by over stimulating the liver; and the conduct of those practitioners who prescribe calomel recklessly or unnecessarily, cannot be too strongly reprobated.

The use of remedies of the simplest kind, and of easy application, is a test of the good judgment and ability of a practitioner; and those who are ready on all occasions to meet every little symptom of disorder by stringent measures, leaving nothing to the reparative energy of nature, may be esteemed not only unskilful, but dangerous advisers.

There is a wide difference between active and energetic proceedings, under control of a sound

judgment, and the rash application of powerful and dangerous remedies.

It is a commonly received opinion, that if white evacuations are passed from the bowels, the liver must be stimulated to a stronger action, and that mercury must be given to produce this effect: no doubt it will do so, but no sooner have the effects of it passed away than want of bile will be again indicated by a return of white evacuations.

Now it often happens that children, from bad feeding, are deficient in blood; and owing to this deficiency no bile is secreted by the liver.

In this instance, the temporary effect of mercury will be to carry blood to the liver, and for the time bile will be secreted; but it will not restore the proper tone to the system, so as to establish the secretion permanently. On the contrary, it will be highly injurious, and must give way to such remedies as tend to increase the general strength, and improve the circulation.

The opposite case of plethora, where no bile is secreted, is to be distinguished by its proper and peculiar symptoms, which require the administration of mercury, as the only remedy to be relied on.

It should be remembered that mercury affects a child differently to an adult: it is not possible to

cause salivation in the former; in the latter, a very few grains will readily do so. It should be most cautiously used; but it is too valuable a medicine to be altogether excluded from the domestic medicine chest.

A small quantity of grey powder during teething will often prevent illness; and it is impossible to calculate how many cases of inflammatory affections I have seen checked by the timely exhibition of a single grain of calomel.

The immediate use of it in croup, before medical assistance can be procured, is strongly recommended; in convulsions it is equally important; and in the ordinary symptoms, preliminary to fever, an early dose may so modify the impending attack, as to render it comparatively slight.

To the above notice of the remedies proper for infantile disease, I cannot omit to add a few words on the reprehensible practice of inexperienced persons undertaking to soothe the pains of childhood by the administration of opium.

In its effect upon children this drug is always uncertain, and in most cases injurious.

I have known a child to sleep for twelve hours after taking the twelfth part of a drop of laudanum; others will be but little affected by a much larger dose.

The effect of constantly repeated doses of

opium is to interrupt the functions of the body, to paralyse the power of digestion, and, at length, produce death by atrophy.

Still more mischievous than even plain opium are the nostrums vended by quacks, which contain some preparation of it, and occasion the death of large numbers of children.

Mr. Browne, coroner for Nottingham, in a return of the number of inquests held in England and Wales, in 1837 and 1838, in cases of death from poison, says, that a celebrated "quack cordial" for children destroys numbers yearly in that borough, but as they die off gradually the cases do not come under his official notice.

It is impossible that the numerous quack medicines, which have a sedative effect, can with safety be administered; for it is scarcely to be expected that the opiate, which is the active ingredient in all, can be mixed regularly, and throughout the whole quantity of the fluid, when it is remembered that many gallons probably are manufactured at the same time. Any delay in agitating the mass, or any want of care in doing so, may cause a partial distribution of the sedative, and thus one division may contain more, and another less, and the former may in consequence be charged with more opiate than is sufficient for the destruction of an infant's life.

In the report which was ordered by the House of Commons, it appears that nearly one-seventh of the inquests held were upon children, whose deaths were caused by the carelessness of mothers or attendants, in administering medicines with the nature of which they were unacquainted, and in excessive doses.

Syrup of poppies, a preparation of the same nature as opium, but milder in its form, is much used in infancy, and many are the deaths that result from it.

As a sedative, in its pure state, it would be found very useful for children; but, except when procured from the very best chemists, its strength cannot be depended on. It is often concocted, at the moment it is wanted, of coloured syrup and laudanum, and is therefore, in inexperienced hands, a very dangerous medicine.

CHAPTER XII.

CHANGE OF AIR, EFFECTS OF COLD, AND
GENERAL REMARKS.

IN order to the recovery of health and strength, after the debilitating effects of disease, change of air is almost always desirable; and whether on such occasions, or as regards permanent residence, it is established that a bracing air is the best suited to children. Except in some few instances of thoracic diseases, where a warm temperature is required, it is found that children thrive better, and obtain a more speedy restoration of health, at such watering-places as Ramsgate and Brighton, which are built on hills, than in sheltered spots, and underneath high protecting cliffs. Few places inland, possess all the varied advantages which are to be found at the sea-side: in real beneficial effects some of them are of equal value.

The salubrious air of Tonbridge Wells is noted for its peculiar influence, not only upon children, but upon invalids of almost all kinds, and espe-

cially upon the female system, which is often, during a residence there, brought into such a healthy state, that pregnancy is at length induced in cases where many years have elapsed since marriage without any symptoms of it having presented themselves.

In the distressing consequences of whooping-cough, the air of Tonbridge Wells is almost a sure remedy. It removes the harassing and protracted remnants of the disease, and enables the constitution to regain its proper vigour.

I have had repeated opportunities of investigating and ascertaining the good effects of a sojourn in this place, in patients who have previously been under my care, and by frequent communication with my brother who is resident there, and whose observations, made in the course of an extensive practice among persons of all ages, have supplied me with such details as completely satisfy me that Tonbridge Wells possesses unusual recommendations for invalids of almost every description. There is an especial freedom from illness in the schools there, and the decidedly tonic effect which belongs to it, is derived, not only from the air, but from the iron which impregnates all the water of the place. Nor will the water of the mineral spring itself be found in general to disagree with the most enfeebled constitutions, if

taken under proper regulations ; and I have no doubt that within a few years Tonbridge Wells will be the most frequented watering-place for children of any in England, owing not only to the benefit derived from a residence there, but also to its being the nearest place of the kind to London, and to the short time in which the journey is now performed.

London, for a town, is very healthy, and the inhabitants of the country are often the better for a temporary sojourn in it ; still, a constant residence there cannot but be injurious, and no variety can be so delightful, or so necessary, as the occasional exchange, of a heavy oppressive atmosphere, for the clear bracing air of the country.

No child should be kept in London during the whole year, without some opportunity of enjoying a purer air. The pale countenances of those who are confined entirely to a London residence, afford the strongest corroboration of the necessity of such a change.

Tonbridge Wells does not, indeed, afford any other opportunities for bathing than are usual at inland watering-places ; but children are generally so much alarmed by the process of sea-bathing, that more harm than good is done by the attempt. Indeed, unless it be unattended by fear, which it

but seldom is, children should on no account be subjected to it.

In early infancy, an ordinary tepid bath night and morning is very useful ; it invigorates, and is enjoyed by the youngest child. It is, however, a mistake to suppose that the daily immersion of a child all the year round in cold water, or almost cold, renders it robust. In the summer it may have that tendency, but in cold weather the effect of such a shock is positively debilitating ; a check is given to the circulation early in the morning, when the child has been long fasting, and it does not recover itself the whole day afterwards. If, however, the water is used warm, it acts in winter as a stimulant ; it promotes and equalises the circulation, and enables all parts of the body to resist the chilling effect of the atmosphere.

Not less erroneous is the prevailing notion, that strength of constitution is gained or established by accustoming children, when young, to bear the cold out of doors in inclement weather. The condition of a child thus exposed is similar to that of a person sitting motionless, and meeting the cutting air in an open carriage ; and the same consequences may be expected as commonly follow such an exposure to cold without exercise. The case is different at a later age,

when children can take sufficient exercise to maintain a proper degree of heat, throughout the body and its extremities.

I am far, indeed, from advocating the equally bad practice of confining children to the house throughout the winter, in rooms where the ventilation is necessarily imperfect ; it is easy to observe a judicious medium between exposure to extreme cold, and such unnecessary confinement within doors, as tends to relax the system, and renders the child susceptible of disease.

An easterly wind has a peculiar influence upon children, and not unfrequently produces in a single night the most serious illnesses ; it retards the progress of the convalescent, and often brings back all the symptoms of disease.

Without inquiring into the supposed causes of this injurious property of an easterly wind, I may suggest the propriety of protecting children against its well known effect of checking the regular secretions of the body ; and though in summer it is seldom hurtful in the same degree as at other seasons of the year, yet even in the warmest days it has more or less an unwholesome influence.

The clothing of children is a subject that is too little thought of in the earliest months ; much

more consideration is given to it at a subsequent period, when in fact it is of less importance.

The effect of cold upon children has already been noticed, and the greater mortality in the winter months than occurs in those of the summer, amongst the youngest children, makes it evident, that much more artificial warmth is required in early age than in after life; and yet we see children with their legs bare and their shoulders uncovered, and no kind of additional dress added to their already too partial clothing, even in the coldest winters; the substitution of a thicker external dress for that worn in the summer is all that is considered essential, and, only when out of doors, is a really increased warmth afforded, by parts of the body hitherto exposed being enveloped in warmer apparel.

It is not my wish to advise the use of too much clothing, or of that kind which has a tendency to produce continual perspiration and relaxation; but it is impossible not to be persuaded of the harm which results from too great an exposure of the body, when we see the blue lips, the cold hands and feet, and the fissured skin of the arms and legs, in infants, who, because they have ruddy faces, are supposed to be in perfect health. In such children will chilblains in-

variably be present, whenever colder weather than usual occurs. I mention this in order to corroborate my assertion, that the circulation is depressed by exposure of the surface of the body to the atmosphere in inclement seasons.

During winter, flannel should always be worn next the skin, and drawers of the same material should form part of the dress, and it would be better for the arms and shoulders to be entirely covered.

Dr. Playfair says, that in breeding cattle, “the young stock always thrive better in winter, and with less food, when kept well sheltered from cold and wet.”*

“Indeed, it has already been shown, that without heat, digestion is impaired; and as the

* Lecture delivered to the Royal Agricultural Society, on the Principles of Nutrition and on the Food of Cattle, December, 1849.

The Earl Ducie fed 100 sheep in covered pens, and they only consumed 20lbs. of Swedes each, in the same space of time that 100 other sheep, confined in uncovered pens, consumed 25lbs., and the former weighed 3lbs. more each after a short period than did the latter.

“When two hives of bees are put together, and only afforded the honey made by one hive, they will equally thrive throughout the winter, and be in as good condition as if each hive separately had partaken of its own honey. The congregation of a greater number of bees creates warmth, and less food is required.”—Transactions of the Oxford Apicarian Society.

growth of an animal depends upon the activity of its vital powers, it must be obvious that every care should be taken to sustain and increase these. Exposure to cold diminishes the energies of vitality (the cause of increase), and elevates that of the chemical powers (the cause of waste)."

Although very great improvement has been made in the management of children since the time when they were swathed in bandages; yet, much objectionable practice is now adopted, and many prejudices entertained that might with propriety be abandoned.

The careless ablution of children, for instance, with water and soap, is in the majority of cases of ophthalmia the cause of that disease, owing to a portion of the soapy water producing irritation in the eyes. Ophthalmia also frequently arises from the absurd practice of applying brandy to the head of a newly-born infant, some of which penetrates between the eyelids: and one of the not unfrequent causes of it, also, is the habit of holding children so near the fire, that the eyes become scorched, and inflammation supervenes.

Some slight bandage is necessary to cover the portion of umbilical cord that remains upon the infant's abdomen after birth; but generally this causes too much pressure, and keeps the abdominal muscles so completely at rest, that when even-

tually it is disused, umbilical hernia supervenes, in consequence of the relaxation of the muscles, and of their tendinous expansions.

In infants, soon after birth, both male and female, a few drops of milk are often found in the breasts, and nurses cause much irritation, and even inflammation, by endeavouring to press this out: nothing can be more hurtful. It should on no account be interfered with; and although for a few hours there may be an undue fulness in the breast, yet it is always better to leave it to the natural means of absorption, rather than to create mischief by interference. Such prejudices as these, but too gradually wearing out, would be far better at once laid aside; they are now happily only entertained by the older nurses; but few of those who are younger and better taught, venture to do anything but what is directed, and it is to hoped that before long people in better life will rely only on what is directed for them by medical men, and will not estimate so highly as they do the advice and assertions of old-fashioned nurses, who are engaged purely in the capacity of servants, and who, like other servants, would simply obey any directions given to them, unless their ability was overrated by those they wait upon, and their presumption encouraged by too much attention to their dictation.

I have seen much of the control that these people exercise over young mothers—of the fear, the excitement, and the misery they create, and I am led to make these remarks purely from the hope that they may, in however little a degree, engender a better state of things; that the mothers will guard against the snare into which they inevitably fall, and that medical men will use efforts to prevent their intentions being thwarted, and their patients made ill, by those whose sole duty ought to consist in waiting upon them, and obeying implicitly the prescribed directions.

There are a variety of minor circumstances attending the delivery of women—such as the placing on the infant's head a peculiar cap at its birth; the requiring an especial kind of flannel, in which the child is to be carried from the bed; the making a great ceremony about absurd trifles, and using effeminate expressions, and other things of this kind, that are too petty to form the subjects of attention of men, and may be left much more aptly to women.

I am led to notice them, because they all tend to make the duties of a medical man appear trifling, and contrast greatly with the much higher and more scientific object he has in view. The great importance that was attached to the

rules, the strict injunctions that were laid down for the observance of them, and the cautions given to students by authors in former times, not to neglect their use, had the direct effect of preventing scientific men from following the practice of midwifery, and of instigating those who were jealous of the knowledge of others, to call midwifery only fit for the practice of women.

Midwifery, as a science, suffers much also from the common-place notion amongst many medical men, that their manner must be altered when in attendance on women in labour: some think they make an impression by adopting a jocular manner; others create fear by their solemnity; and many, by pretending to know more than it has ever yet been possible for the most experienced to comprehend, expose their ignorance by their repeated prognostication, with regard to the duration of labour, or some such puerile calculations—as, whether the child will be a male or a female, a foreknowledge of which has at no time, nor ever will be, possessed by any human being.

Why should a man's manner be altered because he is called to attend a woman in labour? Why should he not be able to give equal confidence by means of his habitual way of expressing himself, as by a false one? But it is the mistaken impression regarding this, that causes the distrust

of patients, and their fears of impending danger, and how often is it possible, when further advice is sought, to sooth the imagination by a quiet explanation of the state of the case ; to impart confidence, by freely answering the many anxious inquiries of the patient and her friends ; in fact, by simply making use of the ordinary words and gesture used by one person in society, in conversation with another.

Midwifery is purely a scientific study ; it cannot be practised effectually by any except those who study it as a science : and he who is acquainted with midwifery in the most comprehensive sense of the word, may be considered more justly a learned man, than he whose qualification consists in being an adept in performing the operation for stone, or in the amputation of a limb.

It is true that midwifery is sometimes practised by women ; but this circumstance does not render it a less scientific study ; the many deaths that annually occur from female attendance will demonstrate the want of power of any but educated persons to understand it ; besides, the same argument would hold good in other instances. if it does so in this, for, with regard to diseases of the feet, are women consulted ; but these complaints are nevertheless considered worthy of the attention of our most eminent surgeons.

In bringing to a conclusion these practical remarks, which have been almost extorted from me by the sufferings to which numbers of children are exposed, as I daily witness, through the ignorance or thoughtlessness of their attendants, I venture to express a hope that they may not only prove useful, in the domestic circle, among parents, and others who have the charge of infancy and youth, but that they may, as tending in however humble a degree, to advance and enforce their own views and principles, obtain a favourable reception from those of my own profession, to whom we are indebted for the establishment, on scientific grounds, of those practical and judicious regulations for the management of children, which are now more or less adopted by the most eminent and successful practitioners.

THE END.



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